DOCUMENT RESUME

ED 450 289 CE 081 492

TITLE	Documenting Student Performance through Effective Performance Assessments: Workshop Summary. Horticulture.
INSTITUTION	Ohio State Univ., Columbus. Agricultural Education Curriculum Materials Service.
SPONS AGENCY	Ohio State Dept. of Education, Columbus. Div. of Career-Technical and Adult Education.
PUB DATE	1999-00-00
NOTE	143p.
AVAILABLE FROM	For full text: http://cms.osu.edu/hortpa.pdf.
PUB TYPE	Guides - Classroom - Teacher (052)
EDRS PRICE	MF01/PC06 Plus Postage.
DESCRIPTORS	Academic Education; *Agricultural Education; Basic Skills; Behavioral Objectives; Competence; *Competency Based Education; Floriculture; High Schools; *Horticulture; Integrated Curriculum; Job Skills; Landscaping; Marketing; Nurseries (Horticulture); *Performance Based Assessment; Plant Growth; Plant Identification; Plant Propagation; Records (Forms); Salesmanship; Secondary Education; *Statewide Planning; *Student Evaluation; Turf Management; Workshops
IDENTIFIERS	*Ohio

ABSTRACT

This document contains materials about and from a workshop that was conducted to help Ohio horticulture teachers learn to document student competence through effective performance assessments. The document begins with background information about the workshop and a list of workshop objectives. Presented next is a key to the 40 performance assessments that are included. A blank performance assessment form is provided for use in developing assessments for competencies not included in the document. A performance critique is provided to assist teachers in evaluating existing and newly developed performance assessments. The remainder of the document consists of the 40 performance assessments, which were developed by Ohio horticulture teachers and which contain the following components: Ohio Competency Analysis Profiles (OCAP) program name; unit number and title; competencies addressed by the performance assessment; terminal performance objective (outcome); competency builders/pupil performance objectives (criteria); list of applied academics competencies; list of equipment, supplies, and other resources to be provided; and list of preparations before the assessment starts. The following are among the agriscience and horticulture topics for which performance assessments are included: marketing and sales; floral design; greenhouse plant production; turf and landscape operations; nursery and garden operations; and soils. (MN)

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ED 450 289

Documenting Student Performance Through Effective Performance Assessments

Workshop Summary

Horticulture

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Curriculum Materials Service
Department of Human and Community Resource Development
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Documenting Student Competence Through Effective Performance Assessments

Workshop Summaries were developed for the following program area:

Horticulture

Documenting
Student Competence
Through Effective Performance
Assessments

Workshop Summary

Horticulture

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Acknowledgments

Documenting Student Competence Through Effective Performance Assessments was written in cooperation with many people in the education community. The Ohio Department of Education, Division of Career-Technical and Adult Education, Agricultural Education Service Staff; Jim and Carol Ogden, State Skills Contest Coordinators; and Will Waidelich, Director, Curriculum Materials Service, developed the workshop program and facilitated the development of the subsequent workshop summary.

The committee in charge of this effort certainly appreciated the time and effort of the quality teachers who participated in the workshops. The two-part workshop focused on refining skills in developing performance assessments and on the development of actual performance assessments that are being distributed in this workshop summary document. The following information is provided to help you understand the process that was used in developing this document.

Background

The Horticulture taxonomy was represented by 12 teachers. Each person attended one workshop in October, 1998 and one in March, 1999. Both workshops were facilitated by Will Waidelich, Director, Curriculum Materials Service.

As a result of these workshops teachers not only upgraded their performance development skills but also generated a packet of performance assessments which measure OCAP competencies. Performance assessments were created as a result of each group's activities. These performance assessments will eventually be professionally edited and marketed through the Curriculum Materials Service. At a minimum this document can be shared with teachers who were unable to attend the workshops. Teachers received credit for any assessments which were published.

Workshop Objectives:

- Refine skills in developing performance instruments
- Create performance assessment instruments that measure student mastery of OCAP competencies
- Use performance assessments to support instruction and learning
- Use performance assessments in documenting competency mastery as reported in the Career Passport
- Evaluate performance assessments created by others

Pages v-vi contain a key to the performance assessments. Teachers will find this useful when using the predeveloped performance assessments. Pages vii-x contain a blank performance assessment for developing assessments for competencies not included in this document. Page xi contains a performance assessment critique. Teachers will find this useful in evaluating these performance assessments as well as newly developed assessments. Finally, an order form is included on page xii to help in obtaining additional performance assessments.

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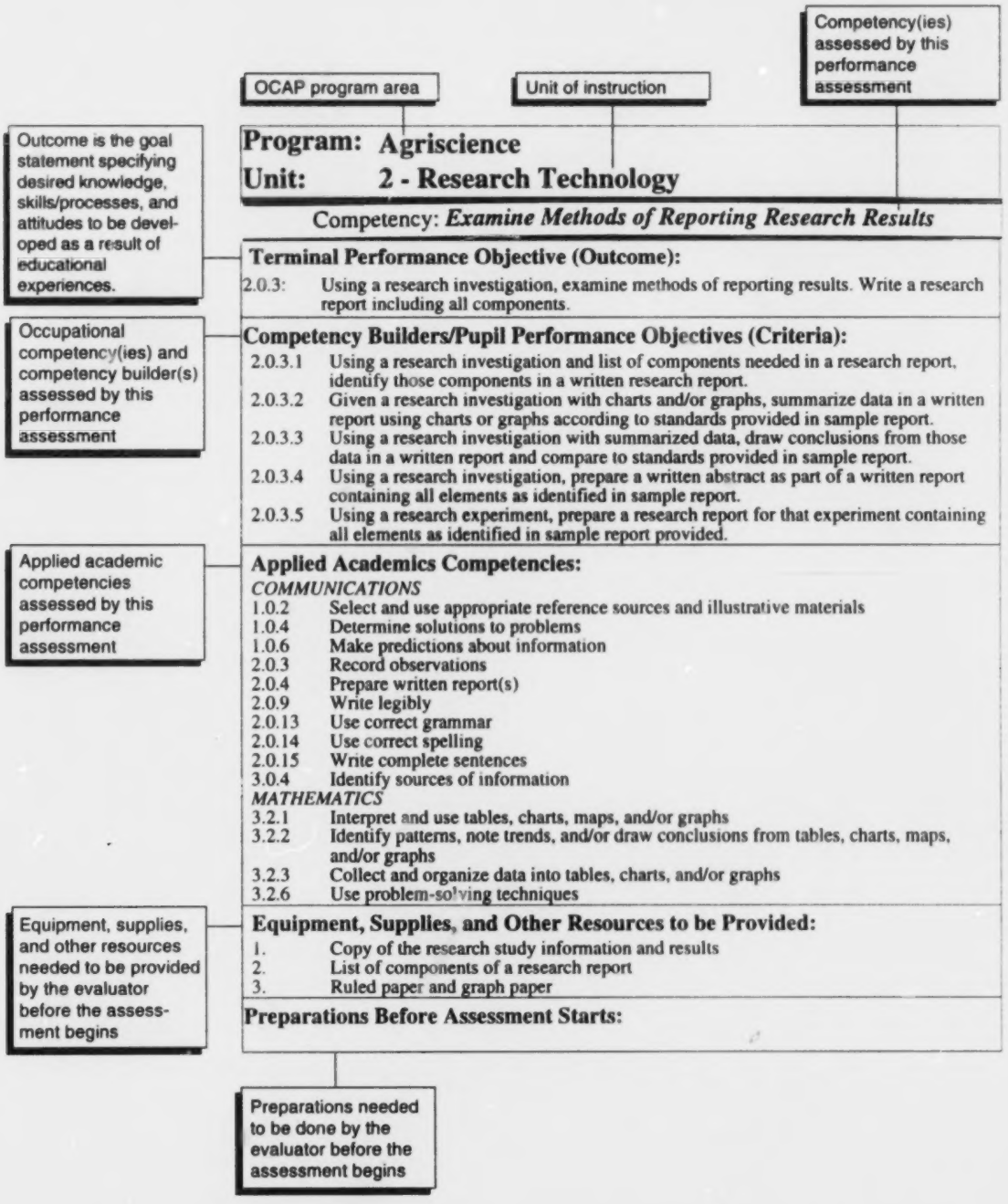
Blank Assessment pages vii
Performance Assessment Critique xi
Order form xii

Competency		Author, School
2.5	Perform presale activities	Jim Scott, Dublin
2.6	Determine customer needs	Jim Scott, Dublin
8.2.1	Select and prepare materials for floral arrangements	Kay Holton, Licking County JVS
8.2.2	Identify available flowers and foliage	Kay Holton, Licking County JVS
8.2.10	Construct bows	Kay Holton, Licking County JVS
8.2.11	Spray-tint dried and live floral products	Kay Holton, Licking County JVS
9.5	Propagate plants	Debra J. Woodworth, Mentor High School
10.2	Demonstrate knowledge of plant physiology and growth	David P. Richards, Auburn Career Center
10.3	Select plants	Jim Scott, Dublin
10.3.11	Select bulbs that are appropriate for the site	Debra J. Woodworth, Mentor High School
10.3.12	Select annual plants that are appropriate for the site	Debra J. Woodworth, Mentor High School
10.3.13	Select perennial plants that are appropriate for the site	Debra J. Woodworth, Mentor High School
10.4	Plan residential landscape design, compiling all necessary information	Douglas A. Young, Live Oaks Career Development Campus
10.4.4	Plan residential landscape design, compiling site analysis, slope, and environmental conditions information	Douglas A. Young, Live Oaks Career Development Campus
10.4.7	Plan residential landscape design, determining plant and seed selection and the hardscape elements	Douglas A. Young, Live Oaks Career Development Campus
10.4.12	Plan residential landscape design, demonstrating equipment use, using measurements, and laying out the design	Douglas A. Young, Live Oaks Career Development Campus
10.4.21	Plan residential landscape design, computing and presenting total price of the project	Douglas A. Young, Live Oaks Career Development Campus
10.4.23	Plan residential landscape design for outdoor privacy area, public area, and service area	Douglas A. Young, Live Oaks Career Development Campus
10.9	Establish turf by seeding	Jim Scott, Dublin
10.9.5	Plant perennial plants chosen for site	Debra J. Woodworth, Mentor High School
10.9.6	Demonstrate the basic procedure for planting shrubs (ball & burlap)	Doug Beck, Coldwater High School, Coldwater
10.9.10	Demonstrate the basic procedure for planting trees (ball & burlap)	Doug Beck, Coldwater High School, Coldwater
10.10	Fertilize the lawn	Jim Scott, Dublin
10.11.2	Demonstrate the proper procedure for maintaining a shrub bed	Jerry Schwochow, Vanguard Career Center
10.11.8	Demonstrate the proper procedure for pruning landscape plants	Jerry Schwochow, Vanguard Career Center
10.11.13	Properly dig out and replant bulbs, corms and tubers	Jerry Schwochow, Vanguard Career Center
10.11.14	Demonstrate proper care and maintenance of plants on a trellis or arbor	Jerry Schwochow, Vanguard Career Center
10.11.15	Demonstrate the proper procedure for staking a tree	Jerry Schwochow, Vanguard Career Center

Contents *(continued)*

10.11.16 Demonstrate the proper procedure for protecting plants against adverse weather and for overwintering container plants ..... Jerry Schwochow, Vanguard Career Center
10.12 Maintain turfgrasses ..... Jim Scott, Dublin
10.13 Plan an Integrated Pest Management program ..... Jim Scott, Dublin
10.22 Establish turf by sodding ..... Jim Scott, Dublin
10.23 Determine and calculate the fertilizer needs for the lawn ..... Jim Scott, Dublin
11.3 Force different varieties of bulbs ..... Debra J. Woodworth, Mentor High School
11.4 Propagate plants ..... David P. Richards, Auburn Career Center
11.5.4 Demonstrate the proper procedures for disbudding and pinching plants ..... Jerry Schwochow, Vanguard Career Center
11.5.7 Demonstrate the proper procedure for transplanting seedlings, plugs, cuttings, and plants ..... Jerry Schwochow, Vanguard Career Center
11.5.10 Demonstrate how to select and mix the proper growth regulator and determine when to apply it ..... Jerry Schwochow, Vanguard Career Center
11.5.12 Perform the correct procedures for tying a plant to a support and thinning out weak shoots ..... Jerry Schwochow, Vanguard Career Center
Soils Select urban uses of soils ..... Tom Holton, East Knox High School

KEY TO PERFORMANCE ASSESSMENTS


Competency(ies) assessed by this performance assessment
OCAP program area
Unit of instruction
Outcome is the goal statement specifying desired knowledge, skills/processes, and attitudes to be developed as a result of educational experiences.
Occupational competency(ies) and competency builder(s) assessed by this performance assessment
Applied academic competencies assessed by this performance assessment
Equipment, supplies, and other resources needed to be provided by the evaluator before the assessment begins
Preparations needed to be done by the evaluator before the assessment begins

Program: Agriscience
Unit: 2 - Research Technology

Competency: ***Examine Methods of Reporting Research Results***

Terminal Performance Objective (Outcome):

2.0.3: Using a research investigation, examine methods of reporting results. Write a research report including all components.

Competency Builders/Pupil Performance Objectives (Criteria):

2.0.3.1 Using a research investigation and list of components needed in a research report, identify those components in a written research report.
2.0.3.2 Given a research investigation with charts and/or graphs, summarize data in a written report using charts or graphs according to standards provided in sample report.
2.0.3.3 Using a research investigation with summarized data, draw conclusions from those data in a written report and compare to standards provided in sample report.
2.0.3.4 Using a research investigation, prepare a written abstract as part of a written report containing all elements as identified in sample report.
2.0.3.5 Using a research experiment, prepare a research report for that experiment containing all elements as identified in sample report provided.

Applied Academics Competencies:

COMMUNICATIONS
1.0.2 Select and use appropriate reference sources and illustrative materials
1.0.4 Determine solutions to problems
1.0.6 Make predictions about information
2.0.3 Record observations
2.0.4 Prepare written report(s)
2.0.9 Write legibly
2.0.13 Use correct grammar
2.0.14 Use correct spelling
2.0.15 Write complete sentences
3.0.4 Identify sources of information

MATHEMATICS
3.2.1 Interpret and use tables, charts, maps, and/or graphs
3.2.2 Identify patterns, note trends, and/or draw conclusions from tables, charts, maps, and/or graphs
3.2.3 Collect and organize data into tables, charts, and/or graphs
3.2.6 Use problem-solving techniques

Equipment, Supplies, and Other Resources to be Provided:

1. Copy of the research study information and results
2. List of components of a research report
3. Ruled paper and graph paper

Preparations Before Assessment Starts:

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KEY TO PERFORMANCE ASSESSMENTS *(cont'd)*

Task is a complex assignment activity requiring multiple responses to a challenging question or problem.

Task:
You are a research assistant who has been given the job of writing a research report. The research experiment has already been conducted and all necessary information is available. You are to write a research report which includes an abstract, the problem, hypothesis, data and results, analysis and conclusion. Your report will be submitted to the project director of the research program.

Student:	Name of student being assessed
Teacher or Designee:	Name of person giving the assessment
Date:	Date of the assessment
School/Employer:	Site of the assessment
Start Time:	Time assessment begins, if a timed assessment

Standard is an established level of achievement, quality of performance, or degree of proficiency.

Criteria are guidelines, rules, or principles by which student responses, products, or performances are judged.

How much weight is given to each criterion if not equal in weight

Criteria *(Competency Builders)*	**Excellent**	**Skilled**	**Needs Help**	**Weight**
Problem	Clearly states purpose of the investigation	Identifies purpose but not in terms of the investigation	Does not relate to purpose of the investigation	
Hypothesis	Relates to problem and gives logical prediction	Relates to problem	Does not relate to problem or give prediction	
Presentation of data	Data complete and clearly presented using tables or graphs	Data complete but lacking in organization	Data collected are incomplete, incorrect, and not organized	
Analysis	Makes clear, critical analysis and logical and reasonable interpretation of data	Presents solution but includes critical errors	Makes little or no interpretation; does not relate a solution to problem	
Summary	Gives brief overview to inform about the entire investigation; relates hypothesis to results	Gives summary that does not inform reader of all significant aspects of investigation or draw a relationship between hypothesis and results	Does not give a summary of the investigation or relate hypothesis to results	
Abstract	Produces abstract that is well organized and contains all components of the investigation	Produces complete abstract, but it lacks organization	Produces abstract with errors or missing data	

Anchor(s) are the representative products or performances used to characterize each point on a scoring scale. They set the standards for performance. The top anchor is sometimes called the exemplar.

Time assessment ends, if a timed assessment

Finish Time: **Score:**

Total score, when weights are given to each criterion

Author(s) of this performance assessment

Portions of this assessment were submitted by A[illegible]n Johnson, Executive Director of Instruction, Ankeny Community Schools; William D. Waid[illegible]ich, Director, Ohio Agricultural Education Curriculum Materials Service, The Ohio State U[illegible]iversity; and Isaac Kershaw, VEPD Liaison, Division of Vocational and Adult Education, O[illegible]o Department of Education.

Rubric is a definition of the measurement scale used to evaluate a student's performance. It consists of a fixed scale, a list of characteristics that describe criteria at each score point for a particular outcome, and sample responses (anchors) for the various score points on the scale.

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Program:

Unit:

Competency:

Terminal Performance Objective (Outcome):

Competency Builders/Pupil Performance Objectives (Criteria):

Applied Academics Competencies:

Equipment, Supplies, and Other Resources to be Provided:
Preparations Before Assessment Starts:
Task:

Criteria *(Competency Builders)*				Weight

Criteria *(Competency Builders)*				Weight

x

Performance Assessment Critique

Criteria	Excellent Refine through implementation	Skilled May need some refinement	Needs Help Needs significant adjustments	Comments
Outcome	Multiple competencies are being measured to develop broad focus	Competency has a broad focus suitable for this type of assessment, all components of TPO provided	Competency focuses on narrow skills development	
Task Identification	Real-world task is clearly defined, is related closely to the outcome; task is related to a "big idea"	Task focuses on real world situation; clarity may need to be refined, may be too structured	Contrived task, vague, difficult to see full relationship with outcome; too structured	
Task Focus	Thought provoking, emphasis is on higher order thinking skills (e.g. diagnosis, analysis)	Challenging task, uses a realistic combination of recall and higher order thinking skills	Task focuses on recall/ memorization, parts are unconnected	
Rubric Criteria	Criteria selection is creative rather than repeating the builders, criteria match extent of task	Clearly defined criteria, all elements of the task are present, teacher's expectations clear	Too few criteria identified for scope of the task, teacher expectations are unclear	
Rubric Standards	Clearly defined with distinctly different levels of performance, focus on quality of work	Most performance levels are distinct from one another, some reliance on negatives, focus on quality	Difficult to tell the difference between levels of performance, focus on quantity, relies on negatives and/or adverbs	
Applied Academic Competencies	Appropriate and manageable competencies identified, selected competencies are measured in rubric	Appropriate and manageable number of competencies have been identified	Competencies are provided but are difficult to identify	
Other Document Contents	All critical information provided with non-critical but supportive information included	Minimum amount of critical information has been provided for successful use of the assessment	Sections of the document are incomplete	

ORDER FORM

DATE _____

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Program: Horticulture

Unit: 2. Marketing and Sales

Competency: ***2.5 Perform Presale Activities***

Terminal Performance Objective (Outcome):

Given the various features and benefits of different products and the various types of selling techniques and customers, the student will be able to identify appropriate selling techniques to a 95% level of accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

2.5.1 Maintain product and service knowledge

2.5.2 Compare the features and benefits of different products

2.5.3 Analyze types of selling techniques

2.5.4 Identify types of customers

2.5.5 Identify customer buying motives

2.5.6 Identify the five basic factors that influence the buying decision of customers

Applied Academics Competencies:

COMMUNICATIONS

RS1	Exhibit knowledge of language structure
RS6	Apply knowledge of language structure to reading
RMC3	Read to clarify personal thinking and understanding
RMC8	Confirm and extend meaning in reading by researching new concepts and facts
RMC20	Use reference books to find, evaluate, and synthesize information
RA1	Select and read material for personal enjoyment and information
RA3	Employ various reading strategies according to purpose
LMC10	Use information gathered from listening and viewing experiences to expand research
LM1	Facilitate learning across curriculum through critical listening and viewing
LM2	Engage in individual, small-group, and whole-group listening and viewing activities
OMC8	Respond to the needs of various audiences
OMC13	Assess needs of audience and adjust language and presentation according to their understanding

Equipment, Supplies, and Other Resources to be Provided:

reference books
videotapes of role-play situations
information on various products and services

Preparations Before Assessment Starts:

The students will be provided instruction on

1. identification of the types of customers
2. identification of the customer buying motives
3. identification and analysis of the various types of selling techniques
4. identification of the factors that influence the buying decision

The students will observe role-play situations from actual job situations.

Task:

Through the use of role-play recorded on videotape and actual situations, you will observe the different types of customers and identify the type of customer in each scenario. Additionally, you will analyze the type of selling technique to use with each customer and the buying motives that motivate each role-play or actual customer.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Skilled	Needs Improvement		Weight
Maintain product and service knowledge	Can describe accurately the products and services available	Has difficulty describing the products and services available		
Compare the features and benefits of different products	Can compare and present the features and benefits of different products with at least 90% accuracy	Cannot compare and present the features and benefits of different products		
Analyze types of selling techniques	Can describe types of selling techniques and correlate them to different types of customers	Struggles to describe types of selling techniques and cannot correlate them to different types of customers		

Identify types of customers	Can properly identify the three types of customers	Cannot properly identify the three types of customers		
Identify customer buying motives	Can identify customer's buying motives and meet his/her needs	Struggles to identify customer's buying motives and cannot meet his/her needs		
Identify the five basic factors that influence the buying decision	Can identify the five basic factors that influence the buying decision	Cannot identify the five basic factors that influence the buying decision.		

Finish Time:		**Score:**	

Portions of this assessment were submitted by Jim Scott, Dublin, Ohio.

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Program: Horticulture

Unit: 2. Marketing and Sales

Competency: ***2.6 Determine Customer Needs***

Terminal Performance Objective (Outcome):

In the school laboratory or actual situation, given the products available and selling techniques, the student will demonstrate ability to sell products successfully and handle customer objections to a 95% level of accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

2.6.1 Greet customers in accordance with company protocol

2.6.2 Interpret customers' descriptions of their needs

2.6.3 Identify products available

2.6.4 Use selling technique appropriate to type of customer

2.6.5 Use product demonstrations, exhibits, and displays

2.6.6 Recommend products to meet customers' needs

2.6.7 Provide product information

2.6.8 Provide care and safety instructions

2.6.9 Recommend alternate products

2.6.10 Recommend 'add-on' items

2.6.11 Handle customer objections in accordance with company policy

Applied Academics Competencies:

COMMUNICATIONS

RS1	Exhibit knowledge of language structure
RS6	Apply knowledge of language structure to reading
RMC3	Read to clarify personal thinking and understanding
RMC8	Confirm and extend meaning in reading by researching new concepts and facts
RMC20	Use reference books to find, evaluate, and synthesize information
RA1	Select and read material for personal enjoyment and information
RA3	Employ various reading strategies according to purpose
RA5	Develop and apply understanding of the interrelationship of concepts
LMC2	Compare new oral texts to past experiences and knowledge in order to enhance comprehension
LMC7	Use prior knowledge and experiences to facilitate comprehension of new oral texts
LMC10	Use information gathered from listening and viewing experiences to expand research
LMC12	Consider prior knowledge and experiences when attempting to understand the meaning of new texts
LM1	Facilitate learning across curriculum through critical listening and viewing
LM2	Engage in individual, small-group, and whole-group listening and viewing activities
OMC3	Use interviewing techniques to gather information
OMC8	Respond to the needs of various audiences
OMC10	Communicate orally to inform and persuade
OMC13	Assess needs of audience and adjust language and presentation according to their understanding
OA5	Develop and apply decision-making strategies

Equipment, Supplies, and Other Resources to be Provided:

selection of products
display materials
reference books

Preparations Before Assessment Starts:

The students will be provided instruction on

1. selling techniques to use with different types of customers
2. conducting demonstrations, setting up exhibits and displays
3. selling alternate products and 'add-on' items
4. handling customer objections
5. how to interpret customer needs
6. steps to conducting a sale

Task:
You will interact with numerous customers in the school greenhouse, floral shop, and landscape department throughout the year. You will need to interpret the customer's needs and use the appropriate selling techniques with each customer. Additionally, you will be expected to provide product knowledge and care instructions to the customer. You will also need to handle customer objections in accordance with the established policy and be able to suggest alternate products and 'add-on' items to the customer.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Acceptable	Unacceptable		Weight
Greet customers	Can greet customers according to company protocol	Cannot greet customers according to company protocol		
Interpret customers' descriptions of their needs	Can interpret customers' needs in a mutually satisfying manner	Has difficulty interpreting customers' needs		
Identify products available	Can share with customer the products available	Has difficulty sharing with customer the products available		
Use appropriate selling technique	Can describe types of selling techniques and correlate them to different types of customers	Struggles to describe types of selling techniques and cannot correlate them to different types of customers		
Use product demonstrations, exhibits, and displays	Can convincingly and confidently use demonstrations, exhibits, and displays to sell the customer	Cannot convincingly use demonstrations, exhibits, and displays to sell the customer		

Recommend products and provide product information	Can recommend products to customers that meet their needs. Can provide information and care and safety instruction to the customer	Struggles to recommend products to customers that meet their needs. Cannot provide information or care and safety instruction to the customer		
Recommend alternate products	Can recommend to customers alternate products that meet their needs	Struggles to recommend to customers alternate products that meet their needs		
Recommend 'add-on' items	Can suggest to customers the purchase of 'add-on' items	Has difficulty suggesting to customers the purchase of 'add-on' items		
Handle customer objections	Can handle customer objections in accordance with company policy	Has difficulty handling customer objections in accordance with company policy		
Finish Time:		**Score:**		

Portions of this assessment were submitted by Jim Scott, Dublin, Ohio.

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Program: Horticulture

Unit: 8. Floral Design

Competency: ***8.2 Select & Prepare Materials for Floral Arrangements***

Terminal Performance Objective (Outcome):

When given flowers, foliage, containers, accessories, and floral supplies, the student will be able to select and prepare appropriate items for given situation.

Competency Builders/Pupil Performance Objectives (Criteria):

8.2.1 Select style appropriate for occasion
8.2.4 Select flowers
8.2.5 Select foliage
8.2.6 Select containers
8.2.7 Prepare containers
8.2.8 Select accessories
8.2.9 Prepare accessories

Applied Academics Competencies:

COMMUNICATIONS

MATHEMATICS
M1 Estimate and use measurements

Equipment, Supplies, and Other Resources to be Provided:

assorted flowers
assorted foliage
assorted floral containers
assorted floral accessories
assorted floral supplies (including floral foam, floral tape, wire, wood picks, waterproof tape)
water

Preparations Before Assessment Starts:

Student will be given instruction in
1. proper use of styles for occasions/situations.
2. selection of flowers appropriate for the occasion/situation.
3. selection of foliage appropriate for the occasion/situation.
4. selection of containers appropriate for the occasion/situation.
5. selection of accessories appropriate for the occasion/situation.

Task:
You are a floral designer at a local flower shop. A customer calls and orders an arrangement for a young girl's outdoor birthday party. Select and prepare materials for this arrangement.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Most Acceptable	Least Acceptable	Unacceptable	Comments
Select style	Selects style appropriate for given situation	Selects style that will satisfy situation, but is not best possible choice	Selects style that is inappropriate for given situation	
Select container	Selects appropriate container for given situation	Selects satisfactory container, but it is not the best possible choice	Selects inappropriate container for given situation	
Prepare container	Wets foam properly; tapes properly and securely	Does not wet foam properly or does not tape properly or securely	Does not wet foam properly and does not tape properly or securely	
Select foliage	Selects foliage that is appropriate for given situation	Selects foliage that will satisfy situation, but is not the best choice	Selects foliage that is inappropriate for given situation	
Select flowers	Selects appropriate flowers for given situation	Selects flowers that will satisfy situation, but are not the best choice	Selects inappropriate flowers for given situation	
Select accessories	Selects appropriate accessories for given situation	Selects accessories that will satisfy situation, but are not the best choice	Selects inappropriate accessories for given situation	
Prepare accessories	Prepares accessories properly	Needs some assistance when preparing accessories	Prepares accessories improperly	
Finish Time:		**Score:**		

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Program: Horticulture

Unit: 8. Floral Design

Competency: ***8.2 Identify Available Flowers and Foliage***

Terminal Performance Objective (Outcome):

When given access to flowers and foliage, students are asked to identify, from memory, flowers and foliage by common name. The flowers and foliage will come from the Ohio FFA Floriculture Career Development Event list.

Competency Builders/Pupil Performance Objectives (Criteria):

8.2.2 Identify available flowers

8.2.3 Identify available foliage

Applied Academics Competencies:

COMMUNICATIONS

RM20 Use reference books to find, evaluate, and synthesize information

MATHEMATICS

Equipment, Supplies, and Other Resources to be Provided:

test paper, flowers and foliage to be identified

Preparations Before Assessment Starts:

Instruction on flower and foliage identification, sources, costs and uses

Task: Given pictures, dried mounts, and live samples of flowers and foliage, list the common name of each beside the number on the test paper. Students will be able to refer to a master list.	
Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	**Most Acceptable**	**Least Acceptable**	**Unacceptable**	**Comments**
Identify flowers	Can correctly identify 90% or more of given flower samples	Can correctly identify 70% to 89% of given flower samples	Can correctly identify less than 70% of given flower samples	
Identify foliage	Can correctly identify 90% or more of given foliage samples	Can correctly identify 70% to 89% of given foliage samples	Can identify less than 70% of given foliage samples	
Finish Time:		**Score:**		

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Program: Horticulture
Unit: 8. Floral Design

Competency: ***8.2 Construct Bows***

Terminal Performance Objective (Outcome):
When given materials and directions, student will construct a bow appropriate for the situation.

Competency Builders/Pupil Performance Objectives (Criteria):
8.2.10 Construct bows

Applied Academics Competencies:
COMMUNICATIONS

MATHEMATICS
M1 Estimate and use measurements

Equipment, Supplies, and Other Resources to be Provided:
assorted sizes, types, and colors of ribbon
wire of assorted gauges
wood picks of assorted lengths

Preparations Before Assessment Starts:
Student will be given instruction in
1. sizes, types, and uses of ribbon.
2. proper construction of a bow.
3. importance of size relationship between bow and arrangement.

Task:
Using the available supplies, construct one of the following bows based on teacher instructions:
1. corsage bow
2. 6" potted plant bow
3. pew bow

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	**Most Acceptable**	**Least Acceptable**	**Unacceptable**	**Comments**
Size of ribbon	Uses appropriate size of ribbon		Uses inappropriate size of ribbon	
Type of ribbon	Uses appropriate type of ribbon		Uses inappropriate type of ribbon	
Color of ribbon	Uses color of ribbon that coordinates with or accents situation		Uses inappropriate color of ribbon for situation	
Number of loops in bow	Makes appropriate number of loops in bow		Makes too many/ too few/uneven number of loops on each side	
Size of loops in bow	Size of loops is consistent and appropriate	Size of loops is consistent or appropriate	Size of loops is not consistent or appropriate	
Ribbon facing	Keeps ribbon facing consistent throughout bow		Has ribbon facing inconsistent throughout bow	
Size of bow	Size of bow is appropriate for given situation	Size of bow will satisfy the situation, but is not the best size	Size of bow is inappropriate for the situation	
Bow streamers	Cuts bow streamers neatly at both appropriate angle and length	Cuts bow streamers at appropriate angle or length	Cuts bow streamers at neither appropriate angle nor length	
Proper gauge wire	Uses proper gauge wire to wire bow	Uses acceptable gauge wire to wire bow	Uses unacceptable gauge wire to wire bow	

Wiring technique	Has bow securely held by wire	Has bow held by wire, but loops will loosen when pulled	Has bow not securely held by wire	
Proper wood pick (if needed)	Uses proper wood pick length for bow		Uses improper wood pick length for bow	
Wood pick attached (if needed)	Securely attaches bow to wood pick	Attaches bow to wood pick, but it will loosen when pulled	Does not attach bow securely to wood pick	
Finish Time:		**Score:**		

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Program: Horticulture

Unit: 8. Floral Design

Competency: ***8.2 Spray-tint Dried and Live Floral Products***

Terminal Performance Objective (Outcome):

When given dried and live floral products and floral sprays, the student will be able to meet the criteria listed in the performance assessment.

Competency Builders/Pupil Performance Objectives (Criteria):

8.2.11 Spray-tint dried and live floral products

Applied Academics Competencies:

COMMUNICATIONS

MATHEMATICS

Equipment, Supplies, and Other Resources to be Provided:

dried floral products

fresh floral products

assorted floral sprays

Preparations Before Assessment Starts:

Student will be given instruction in the proper techniques for spraying/tinting dried and fresh floral products.

Task: You are to spray and tint the given dried and fresh floral products according to the proper techniques learned in class.	
Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	**Most Acceptable**	**Least Acceptable**	**Unacceptable**	**Comments**
Select appropriate floral spray/tint	Selected appropriate floral spray for project		Selected inappropriate floral spray for project	
Shake can	Shook can vigorously for at least 1 minute after can agitator rattled	Shook can for less than 1 minute after can agitator rattled	Did not shake can at all	
Check flow	Pointed nozzle into trash can, paper towel, or box and sprayed to test	Pointed nozzle to test spray into inappropriate area	Did no test spray to check nozzle flow	
Spray floral products	Held can approximately 14" from product, applied several thin coats of paint, protected area from overspray	Held can either more or less than 14" from product, or applied heavy coating, or did not protect area from overspray	Held can an inappropriate distance from product, applied heavy coating, and failed to protect area from overspray	
Tint floral products	Held can approximately 14" from product, applied several thin coats of paint, protected area from overspray, compressed flower so that only edges were tinted	Held can either more or less than 14" from product, or applied heavy coating, or did not protect area from overspray, or did not compress flower so that only edges were tinted	Held can an inappropriate distance from product, applied heavy coating, failed to protect area from overspray, and did not compress flower so that only edges were tinted	

Clean up	Turned can upside down with nozzle pointing into a paper towel, pushed nozzle until only air was discharged to clear paint from valve		Failed to clear paint from valve by pointing can nozzle upside down into paper towel	
Finish Time:		**Score:**		

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Program: Horticulture

Unit: 9. Greenhouse Plant Production

Competency: ***9.5 Propagate Plants***

Terminal Performance Objective (Outcome):

When given all equipment within the greenhouse laboratory, the student will propose a satisfactory annual production program. The program will be evaluated on the basis of cost and the condition of the annual plants.

Competency Builders/Pupil Performance Objectives (Criteria):

9.5.1 Follow general safety precautions related to propagation

9.5.2 Sow seeds

9.5.5 Take cuttings

9.5.6 Plant cuttings

9.5.7 Apply rooting hormones

9.5.8 Plant plugs

9.5.9 Label plants and cuttings

Applied Academics Competencies:

COMMUNICATIONS

RS1 Exhibit knowledge of language structure

RS6 Apply knowledge of language structure to reading

RM3 Read to clarify personal thinking and knowledge

RM20 Use reference books to find, evaluate, and synthesize information

RM2 Read to facilitate learning across curriculum

MATHEMATICS

M1 Estimate and use measurements

M13 Compute total sales from variety of items

D1 Organize data into tables, charts and graphs

Equipment, Supplies, and Other Resources to be Provided:

chalkboard, chalk, erasers, plants, rooting hormone, propagation chamber, water, media, containers, labels, permanent marker, plug trays, mechanical seeder, seeds, propagation knife, dibble

Preparations Before Assessment Starts:

Task:
You are assigned to a greenhouse and given all the supplies needed to fill it with annuals for your spring sale. However, you do not have enough seeds to produce a full greenhouse; therefore, you must take cuttings from your plants. You are to use all possible space in order to maximize your profits. You are to keep track of royalties of each plant propagated.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Still Catching On	Weight
Follow general safety precautions related to propagation	Takes cuttings carefully; holds sharp edge of knife away from body, avoiding getting cut	Takes cuttings carefully, at a slower pace; sometimes holds sharp edge of knife facing the body	Is careless and hurried in taking cuttings; frequently has the sharp knife edge facing the body when making a cut	
Sow seeds	Does read planting directions if questions arise. Usually plants seeds at proper depth	Usually plants seeds at proper depth, but needs a little guidance while planting	Needs supervision at all times while planting seeds. Has difficulty judging correct depth to plant	
Take cuttings	Takes cuttings from appropriate locations on the stock plant; prepares cuttings correctly	Takes cuttings correctly, but first needs help in locating the appropriate locations on the stock plant	Needs guidance while taking cutting. Struggles with the location on the stock plant and with the cut itself	
Plant cuttings	Plants cuttings to the appropriate depth in moist soil	Knows how to plant cuttings, but struggles with the appropriate depth to plant them	Struggles with planting the cuttings; needs constant supervision and reinforcement	
Apply rooting hormones	Applies appropriate amount of rooting hormone to base of cutting where node is located	Applies rooting hormone to cutting correctly, but sometimes has too much powder on the cutting	Is unsure where to apply rooting hormone or how much to apply; needs more supervision	
Plant plugs	Removes plugs carefully from tray and plants them at appropriate depth in moist soil	Removes plugs carefully and plants them in moist soil; sometimes struggles with correct planting depth	Is not always gentle while removing plugs from tray; may plant plugs at correct depth, but not always in moist soil	

Label plants and cuttings	Always labels cuttings or plants immediately after planting them. Is very organized with inventory	Labels plants and cuttings efficiently. Needs a little help with organizational skills	Struggles with labeling plants and cuttings in a timely fashion. Needs help with organizational skills when taking inventory	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Debra J. Woodworth, Mentor High School, Mentor.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.2 Demonstrate Knowledge of Plant Physiology and Growth***

Terminal Performance Objective (Outcome):

Given a list of terms and a diagram, the student will demonstrate knowledge of plant physiology and growth by identifying basic plant parts and their functions with 70% accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.2.3 Identify basic plant parts and their functions

10.2.4 Explain the photosynthesis process and its function listing major ingredients, primary anatomy, impact on growth, and effect of environmental factors

10.2.5 Identify the primary function and anatomy of roots, stems, leaves and flowers

- Provide a list of five plant hormones and identify the location of production and the effect of each on plant development
- Explain the effect of cold acclimation and dormancy on plant development and the impact on survivability of plants in each of the U.S.D.A. hardiness zones for Ohio, differentiating between broadleaf evergreens and deciduous plants

Applied Academics Competencies:

COMMUNICATIONS

C12 Present persuasive argument based on the scientific aspects of controversial issues

C15 Keep journals of observations and inferences made over a period of time, and reflect upon the impact of these recorded ideas on own thinking and action

C17 Collect and analyze observations made over extended periods of time and compare these to scientific theory

C23 Seek information on topics of personal scientific interest from a variety of sources

MATHEMATICS

Equipment, Supplies, and Other Resources to be Provided:

1. Chapter 7, Basic Principals of Plant Growth from *Ohio Certified Nursery Technician Landscape Manual*
2. Diagram of basic plant structures

Preparations Before Assessment Starts:

Task:

1. Identify the primary plant structures (flowers and flower parts, stems, leaves, and roots).
2. Identify the secondary plant structures (photosynthetic, reproductive, and conductive).
3. Give the effect that each of the following factors/structures has on plant growth and development: photosynthesis, transpiration, roots, flowers, meristem, hormones, cold acclimation/dormancy/hardiness.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Competent	Advancing	Introductory	Weight
Identify basic plant parts and give their functions	Identifies all primary plant parts and gives their functions	Identifies all primary plant parts and gives over 50% of their functions	Identifies primary plant parts	
Explain photosynthesis, its function in plant development, and the primary and secondary anatomy involved in the process	Fully explains photosynthesis and the anatomy involved as it pertains to plant development	Explains photosynthesis and its impact on plant development	Explains photosynthesis	
Identify anatomy and and give function of roots, stems, leaves, and flowers	Fully identifies anatomy and gives function of roots, stems, leaves, and flowers	Fully identifies anatomy of roots, stems, leaves, and flowers; gives function of 75% of the identified structures	Identifies anatomy of roots, stems, leaves, and flowers	

Identify 5 plant hormones, their effect on plant development, and their production site in the plant	Identifies 5 plant hormones, their effect on plant development, and their production site in the plant	Identifies 5 plant hormones and their effect on plant development	Identifies 5 plant hormones	
Explain cold acclimation and dormancy as they relate to USDA hardiness zones and their effect on plant survivability in the landscape	Explains cold acclimation in relation to USDA hardiness zones and its effect on plant survivability in the landscape	Explains cold acclimation and its effect on plant survivability in the landscape	Is familiar with USDA cold hardiness zones	
Finish Time:		**Score:**		

Portions of this assessment were submitted by David P. Richards, Auburn Career Center, Concord Twp.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.3 Select Plants***

Terminal Performance Objective (Outcome):

When given site conditions, the student will select turfgrasses that are appropriate for the site at a 95% level of accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.3.19 Select turfgrasses

10.3.22 Identify different varieties of turfgrasses

10.3.23 Interpret the seed label

Applied Academics Competencies:

COMMUNICATIONS

RS1 Exhibit knowledge of language structure

RS6 Apply knowledge of language structure to reading

RS7 Explain why there may be more than one interpretation of reading selections

RMC3 Read to clarify personal thinking and understanding

RMC20 Use reference books to find, evaluate, and synthesize information

RM2 Read to facilitate learning across curriculum

OMC4 Communicate orally to entertain and to inform

MATHEMATICS

M1 Estimate and use measurements

D1 Organize data into tables, charts, and graphs

Equipment, Supplies, and Other Resources to be Provided:

turfgrass seed labels

turfgrass specimens

reference books

computer

Internet

Preparations Before Assessment Starts:

Students will be provided instruction in

1. varieties of turfgrasses
2. selection characteristics of the various turfgrass varieties
3. how to interpret a turfgrass seed label

Task:
You are assigned a specific lawn area of the school and laboratory or other actual site. In this area, you are to identify the turfgrass(es) that is/are present. You are also to identify the appropriate turfgrass(es) to be sown in your assigned lawn area. Once you select a turfgrass variety or varieties, you will interpret the appropriate label(s).

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Improvement	Weight
Select turfgrasses	Has extensive knowledge of turfgrasses that are native, hardy and available in the area	Has adequate knowledge of turfgrasses that are native, hardy and available in the area	Has little knowledge of turfgrasses that are native, hardy and available in the area	
Identify different varieties of turfgrass	Can identify most varieties of turfgrass native to and available in the area	Can identify some varieties of turfgrass native to and available in the area	Struggles to identify most varieties of turfgrass native to and available in the area	
Interpret the seed label	Can differentiate between high quality and poor quality seed. Can identify the content of the seed label. Understands the cost differentials	Can differentiate between high quality and poor quality seed. Can identify the content of the seed label	Has little knowledge of the seed label and its content or the relative importance of the cost differentials	
Finish Time:		**Score:**		

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.3 Select Plants; 10.4 Plan Landscape Design***

Terminal Performance Objective (Outcome):

Given site conditions and budget, the student will select the proper bulbs to plant in the area with 90% accuracy.

Given site conditions, budget, and time, the student will develop a bulb planting for the neighbor's landscape with 85% accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.3.8 Identify plants suitable for the environmental conditions

10.3.9 Identify improved varieties

10.3.11 Select outdoor bulbs

10.4.4 Analyze site conditions

10.4.6 Consider environmental conditions in determining plant requirements

10.4.7 Select plant and seed varieties to be used

Applied Academics Competencies:

COMMUNICATIONS

RS1 Exhibit knowledge of language structure
RM1 Demonstrate ability to recognize appropriate pre-reading strategies
RM20 Use reference books to find, evaluate, and synthesize information
OS1 Refine oral communication skills
OS5 Use language imaginatively
OM10 Communicate orally to inform and persuade
WS2 Clarify word choice according to audience, topic, and purpose

MATHEMATICS

M2 Understand the need for measurement and the probability that any measurement is accurate to some designated specification
M9 Construct and interpret maps, tables, charts, and graphs as they relate to real-world mathematics
M13 Compute total sales from a variety of items
M17 Express and apply different types of measurement scales
M18 Determine area and volume

SCIENCE

Q9 Make and read scale drawings, maps, models, and other representations to aid planning and understanding
Q13 Design and conduct investigations with multiple variables
Q 14 Communicate the results of investigation clearly in a variety of situations
Q 28 Modify personal opinions, interpretations, explanations, and conclusions based on new information

Equipment, Supplies, and Other Resources to be Provided:

site plan, site descriptions, supplier catalog, trowels, bulbs, fertilizers, mulch

Preparations Before Assessment Starts:

Task:
You are a landscape designer who specializes in bulbs. You have been employed by your neighbor to design his front yard. The hardscape has already been planted; he wants you to add color for all four seasons by using bulbs. Your neighbor has supplied you with a site analysis, his preference for mass planting, and a list of his favorite colors. You need to design a bulb planting for continuous color.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	**Excellent**	**Skilled**	**Still Catching On**	**Weight**
Proper bulb selection for all seasons	Has chosen the appropriate bulbs for site, bloom color and time	Has selected the proper colors for client, but bloom time is off in one season	Has selected proper colors for bulbs, but two or more seasons are without blooms	
Proper bulb selection for the site conditions	Has chosen the appropriate bulbs for the site's soil and light conditions	Has selected the proper bulbs for the site's soil condition, but not for the light	Needs help selecting the proper bulb for the light and soil conditions	
Design with the ability to carry the eye through the landscape	Succession of color and mass flow carries the eye through the landscape	Mass size is good, but colors do not flow with ease through the landscape	Color flows nicely through the landscape, but bulbs are planted in small clumps, not massed	
Appropriate planting depth for bulb variety	Each variety of bulb was planted at the proper depth	Most bulb varieties were planted at correct depth with little error	Most bulbs were planted at wrong depths	
Presentation of design to the neighbor	Explained design to the neighbor with clarity and confidence	Explained design to the neighbor with confidence, but lacked clarity	Explained design to the neighbor with little confidence or clarity	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Debra J. Woodworth, Mentor Public Schools, Mentor.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.3 Select Plants***

Terminal Performance Objective (Outcome):

Given site conditions, the student will select annuals that are appropriate for the site with 80% accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.3.2 Obtain information on plant material using standard references
10.3.4 Classify turf and landscape plants as annuals, biennials, or perennials
10.3.5 Classify turf and landscape plants according to scientific name
10.3.8 Identify plants suitable for the environmental conditions
10.3.9 Identify improved varieties
10.3.10 Evaluate nursery plant materials
10.3.12 Select annual flowers

Applied Academics Competencies:

COMMUNICATIONS
RS1 Exhibit knowledge of language structure
RS6 Apply knowledge of language structure to reading
RM3 Read to clarify personal thinking and knowledge
RM20 Use reference books to find, evaluate, and synthesize information
RM2 Read to facilitate learning across curriculum
MATHEMATICS
M1 Estimate and use measurements
M13 Compute total sales from variety of items
D1 Organize data into tables, charts, and graphs

Equipment, Supplies, and Other Resources to be Provided:

reference books, chalkboard, chalk, eraser, light meter, soil testing kit and annuals

Preparations Before Assessment Starts:

Field trip to a local nursery

Task:
You are given an area 60 feet long and 10 feet wide to plant annuals. Theme of the area is that of a cool-colored English garden. The area is located at the State Park's entrance. The State wants their guests to get a warm and inviting feeling from the area.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Still Catching On	Weight
Obtain information on plant material using standard references	Knows where to find reference materials and how to use them	Knows how to use reference materials, but is not proficient in locating them	Needs guidance in locating and using reference materials	
Classify turf and landscape plants as annuals, biennials, or perennials	Clearly explains differences in life cycles of annuals, biennials, and perennials	Can communicate the differences between two of the three life cycles	Struggles with the different life cycles, but knows there are differences	
Classify turf and landscape plants according to scientific name	Can give both genus and specific epithet for many common annuals	Struggles with the genus and specific epithet of some common annuals	Struggles with both the genus and the specific epithets	
Identify plants suitable for the environment conditions	Can easily select annuals for different light, moisture, and soil pH conditions	Can select annuals for different light and moisture conditions, but needs help with soil pH	Can identify annuals for different light requirements, but struggles with other environmental conditions	
Identify improved varieties	Can point out new, improved varieties for the season and explain how they are improved	Can identify new, improved varieties, but struggles with explaining how they are improved	Struggles with identifying new varieties and explaining how they are improved	
Evaluate nursery plant material	Can evaluate quality of nursery stock in terms of health and vigor. Advises a customer confidentially as to which plants to select	Can identify healthy nursery stock	Struggles with identifying diseased plants	

Select annual flowers	Can easily select annuals based on size, shape, color, light, and moisture requirements needed for a given area	Can select annuals based on color, light and size needed for a given area	Struggles with selecting proper annual for an area and still uses reference guide	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Debra J. Woodworth, Mentor High School, Mentor.

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Program: Horticulture
Unit: 10. Turf and Landscape Operations

Competency: ***10.3 Select Plants***

Terminal Performance Objective (Outcome):

Given site conditions, the student will select perennials that are appropriate for the site with 85% accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.3.1 Identify local plants
10.3.2 Obtain information on plant material using standard references
10.3.3 Classify turf and landscape plants as monocots or dicots
10.3.4 Classify turf and landscape plants as annuals, biennials, or perennials
10.3.5 Classify turf and landscape plants according to scientific name
10.3.6 Classify turf and landscape plants according to growth habit
10.3.7 Classify flowering trees and shrubs according to the sequence in which they bloom
10.3.8 Identify plants suitable for the environmental conditions
10.3.9 Identify improved varieties
10.3.10 Evaluate nursery plant materials
10.3.13 Select perennial flowers

Applied Academics Competencies:

COMMUNICATIONS
RS1 Exhibit knowledge of language structure
RS6 Apply knowledge of language structure to reading
RM3 Read to clarify personal thinking and knowledge
RM20 Use reference books to find, evaluate, and synthesize information
RM2 Read to facilitate learning across curriculum
MATHEMATICS
M1 Estimate and use measurements
M13 Compute total sales from variety of items
D1 Organize data into tables, charts, and graphs

Equipment, Supplies, and Other Resources to be Provided:

reference books, chalkboard, chalk, erasers, light meter, soil testing kit, and perennials

Preparations Before Assessment Starts:

Field trip to a local nursery

Task:
You are assigned a century home for which you are to design an English garden. The garden area is to be located in front of the house. There is a rustic fence that lines the sidewalk. The homeowner wants the garden to start at the sidewalk and go back to the house. There is a generous budget of $100,000.00.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	**Excellent**	**Skilled**	**Still Catching On**	Weight
Identify local plants	Has knowledge of plants that are native, hardy and available in the area	Knows which plants are available and hardy for the area	Has little knowledge of what plants are available or hardy in the area	
Obtain information on plant material using standard references	Knows where to locate reference books and how to use them to obtain information	Knows where to find reference books, but struggles to use them effectively	Needs guidance in locating and using reference books	
Classify turf and landscape plants as annuals, biennials, or perennials	Clearly explains differences in life cycles of annuals, biennials, and perennials	Can explain the differences in life cycle between two of the following: annual, biennial, or perennial	Struggles with three different life cycles, but knows there are differences	
Classify turf and landscape plants according to scientific name	Can give both genus and specific epithet for many perennials available in the area	Knows the genus and specific epithet of some perennials available in the area	Struggles with the genus and specific epithet of most perennials in the area	
Classify turf and landscape plants according to growth habit	Can easily determine which perennials should be used for the border and which for the background	Can choose the proper plant for a location; may need to double-check with reference books	Often selects plants that are out of proportion for the planting area	
Classify flowering trees and shrubs according to the sequence in which they bloom	Makes good selection of the plant material that will give homeowner continuous bloom throughout the four seasons	Makes good selection of the plant material that will give homeowner an array of color for three of four seasons; fourth season is lacking in color	Has a hard time selecting plants for multiple seasons Provides outstanding one-season bloom	

Identify plants suitable for the environmental conditions	Can easily select perennials for different light, moisture, soil pH, and seasonal conditions	Can select perennials for different light and moisture requirements, but struggles with pH conditions	Can identify different perennials for light requirements, but needs a reference book for other environmental factors	
Identify improved varieties	Can select the season's new and improved varieties and explain the improvements to the customer	Can identify the season's new and improved varieties, but struggles when explaining the improvements	Has trouble identifying the season's new and improved varieties	
Evaluate nursery plant materials	Can evaluate the quality of the nursery stock in terms of health, shape, and vigor; can confidentially explain choice to customer	Can identify healthy nursery stock	Has trouble selecting healthy nursery stock for the design	
Select perennial flowers	Can easily select perennials based on size, color, bloom period; can adjust soil pH, maintenance, light, and moisture requirements for the garden	Can select perennials based on color, light, bloom period, and moisture requirements; struggles with plant size and soil pH	Has trouble selecting the proper perennials for the English garden; still uses reference books	
Finish Time:		**Score:**		

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Program: Horticulture
Unit: 10. Turf and Landscape Operations

Competency: ***10.4 Plan Residential Landscape Design***

Terminal Performance Objective (Outcome):

In the school laboratory or actual situation, given a residential site plan, budget (3% of property value), and deadline for submission, the student will complete a landscape design following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

Competency Builders/Pupil Performance Objectives (Criteria):

10.4.4 Analyze site conditions

- Student will be able to analyze site conditions relative to environment, goals and program of action.

10.4.6 Consider environmental conditions in determining plant requirements

- Student will be able to evaluate environmental conditions relative to climate, topography, exposure and soil.

10.4.7 Select plant and seed varieties to be used

- Student will be able to select plant and seed varieties appropriate for the existing environmental conditions.

10.4.8 Determine correct slope for adequate drainage

- Student will be able to determine the correct slope for adequate drainage according to local codes and industry standards.

10.4.9 Calculate square footage of lawn

- Student will be able to accurately calculate the square footage of lawn for given landscape design project.

10.4.10 Calculate cubic measurements of soil

- Student will be able to correctly calculate the cubic measurements of soil for given landscape design project.

10.4.11 Identify the hardscape elements of a landscape design

- Student will be able to correctly identify the hardscape elements of a given landscape design.

10.4.12 Identify standard drafting equipment and the function of each piece

- Student will be able to correctly identify standard drafting equipment and the function of each piece.

10.4.13 Lay out landscape designs using drafting equipment

- Student will be able to correctly lay out landscape designs using drafting equipment, meeting all Principles of Landscape Design.

10.4.16 Depict existing plant material and objects on a landscape design

- Student will be able to correctly depict existing plant material and objects on a landscape design acceptable to industry standards.

10.4.17 Draw landscape symbols

- Student will be able to draw landscape symbols acceptable to industry standards.

10.4.18 Locate focal point

- Student will be able to correctly locate the focal point meeting all Principles of Landscape Design.

10.4.20 Draw plan to scale

- Student will be able to accurately draw plan to scale.

10.4.21 Design residential plantings

- Student will be able to correctly design residential plantings following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

10.4.23 Design outdoor privacy areas

- Student will be able to correctly design outdoor privacy areas following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

10.4.25 Design public areas

- Student will be able to correctly design public areas following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

10.4.27 Design service areas

- Student will be able to correctly design service areas following an industry- accepted "Landscape Design Process," meeting all Principles of Landscape Design.

Applied Academics Competencies:

COMMUNICATIONS

RM20 Use reference books to find, evaluate, and synthesize information

- Student will be able to use reference books to find, evaluate, and synthesize information to facilitate the research process.

RM9 Read to facilitate content learning

- Student will be able to read to facilitate content learning during the research process.

WS2 Clarify word choice according to audience, topic, and purpose

- Student will be able to clarify word choice according to audience, topic, and purpose to facilitate communication.

OS1 Refine oral communication skills (e.g., voice modulation, eye contact, body language)

- Student will be able to refine oral communication skills to facilitate topic presentation.

OS10 Expand vocabulary to fit topic

- Student will be able to expand vocabulary to fit topic to facilitate communication.

OM9 Gather and assess information for speaking

- Student will be able to gather and assess information for speaking to facilitate communication.

OM10 Communicate orally to inform and persuade

- Student will be able to communicate orally to inform and persuade to facilitate communication.

MATHEMATICS

M1 Estimate and use measurements

- Student will be able to estimate and use measurements accurately to draw a landscape plan and depict all related objects.

M13 Compute total sales from a variety of items

- Student will be able to accurately compute total sales from a variety of items relative to assigned landscape design.

M17 Express and apply different types of measurement scales

- Student will be able to accurately express and apply different types of measurement scales to facilitate the planning of different sizes of projects.

M18 Determine area and volume

- Student will be able to accurately determine area and volume relative to assigned landscape design.

E4 Use mental computation when computer and calculator are inappropriate

- Student will be able to use mental computation when computer and calculator are inappropriate relative to assigned landscape design.

SCIENCE

Q2 Use ratios, proportions, and probabilities in appropriate problem situations

- Student will be able to use ratios, proportions, and probabilities in appropriate problem situations to facilitate accurate completion of assigned landscape design.

Q9 Make and read scale drawings, maps, models, and other representations to aid planning and understanding

- Student will be able to make and read scale drawings, maps, models, and other representations to aid planning and understanding relative to accurate completion of assigned landscape design.

Q11 Use appropriate units for counts and measures

- Student will be able to use appropriate units for counts and measures to facilitate accurate completion of assigned landscape design.

Q12 Create and use databases (electronic and other) to collect, organize, and verify data and observations

• Student will be able to create and use databases (electronic and other) to collect, organize, and verify data and observations to facilitate accurate completion of assigned landscape design.

C13 Collect, store, retrieve, and manipulate information with available technologies that may range from hand processes up through computer applications

• Student will be able to collect, store, retrieve, and manipulate information with available technologies that may range from hand processes up through computer applications relative to assigned landscape design.

A29 Design management plans for natural and human-altered environments (e.g., woodlots, patios, lots, lawns, farmlands, forests)

• Student will be able to design management plans for natural and human-altered environments relative to assigned landscape design.

Equipment, Supplies, and Other Resources to be Provided:

- drawing board, drafting paper, drafting supplies
- site specifications, family data (including family members, ages, pets), and data indicating the family's wants and needs
- a budget and timeline for completion
- all resources necessary to research material specifications and costs

Preparations Before Assessment Starts:

1. Student must be thoroughly familiar with the "Landscape Design Process."
2. Student must be thoroughly familiar with standard drafting equipment.
3. Student must be thoroughly familiar with landscape design symbolism.
4. Student must be thoroughly familiar with all Principles of Landscape Design.
5. Student must be thoroughly familiar with plant and seed varieties.
6. Student must be thoroughly familiar with hardscape materials and their uses.
7. Student must be thoroughly familiar with mathematical formulas for area and volume.

Task:

You are a landscape designer who has been given the job of completing a residential landscape design. You will need to follow the "Landscape Design Process" and compile all necessary information including problem, data, analysis, maintenance, and conclusion. The landscape design should increase the value, beauty, and use of the property. Your total project should be within +/- 10% of the given budget. You will need to identify and collect standard drafting equipment and demonstrate the function of each piece of equipment. You will need to follow the "Landscape Design Process" while you correctly lay out the landscape design using standard drafting equipment. You will need to correctly depict existing plant material and objects on the landscape design. You first need to identify the focal point according to the "Principles of Landscape Design." Next, you will design the outdoor privacy areas, the public areas, and the service areas, meeting all "Principles of Landscape Design." You will then determine plant and seed selection and identify the hardscape elements of the landscape design. You will need to compute the total sale price of your project including materials, labor, mark-up and tax. Upon completion of the project you will present your landscape design to the class, including explanations, descriptions, pricing, and maintenance.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Training	Weight
Finish Time:		**Score:**		

Portions of this assessment were submitted by Douglas A. Young, Live Oaks Career Development Campus, Milford.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.4 Plan Residential Landscape Design***

Terminal Performance Objective (Outcome):

In the school laboratory or actual situation, given a residential site plan, budget (3% of property value), and deadline for submission, the student will complete a landscape design following an industry-accepted "Landscape Design Process" meeting all Principles of Landscape Design.

Competency Builders/Pupil Performance Objectives (Criteria):

10.4.4 Analyze site conditions

- Student will be able to analyze site conditions relative to environment, goals and program of action.

10.4.6 Consider environmental conditions in determining plant requirements

- Student will be able to evaluate environmental conditions relative to climate, topography, exposure and soil.

10.4.8 Determine correct slope for adequate drainage

- Student will be able to determine the correct slope for adequate drainage according to local codes and industry standards.

Applied Academics Competencies:

COMMUNICATIONS

WS2 Clarify word choice according to audience, topic, and purpose

- Student will be able to clarify word choice according to audience, topic, and purpose to facilitate communication.

OS10 Expand vocabulary to fit topic

- Student will be able to expand vocabulary to fit topic to facilitate communication.

MATHEMATICS

M1 Estimate and use measurements

- Student will be able to estimate and use measurements accurately to draw a landscape plan and depict all related objects.

E4 Use mental computation when computer and calculator are inappropriate

- Student will be able to use mental computation when computer and calculator are inappropriate relative to assigned landscape design.

SCIENCE

Q2 Use ratios, proportions, and probabilities in appropriate problem situations

- Student will be able to use ratios, proportions, and probabilities in appropriate problem situations to facilitate accurate completion of assigned landscape design.

Q12 Create and use databases (electronic and other) to collect, organize, and verify data and observations

- Student will be able to create and use databases (electronic and other) to collect, organize, and verify data and observations to facilitate accurate completion of assigned landscape design.

C13 Collect, store, retrieve, and manipulate information with available technologies that may range from hand processes up through computer applications

- Student will be able to collect, store, retrieve, and manipulate information with available technologies that may range from hand processes up through computer applications relative to assigned landscape design.

Equipment, Supplies, and Other Resources to be Provided:

- drawing board, drafting paper, drafting supplies
- site specifications, family data (including family members, ages, pets), and data indicating the family's wants and needs
- a budget and timeline for completion
- all resources necessary to research material specifications and costs

Preparations Before Assessment Starts:

Student must be thoroughly familiar with the "Landscape Design Process."

Task:
You are a landscape designer who has been given the job of completing a residential landscape design. You will need to follow the "Landscape Design Process" and compile data related to site analysis, environmental conditions used to determine plant selection, and slope required to provide proper drainage.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	**Excellent**	**Skilled**	**Training**	Weight
Analyze site conditions	Completes data on environment, customer goals, & plan of action without assistance	Completes data on environment, customer goals, & plan of action with supervision	Knows only that this is important information, but doesn't know how to collect it	20
Evaluate environmental conditions in determining plant requirements	Considers climate, soil, & topography, and selects plants relative to findings without assistance	Uses climatic information to aid in selecting plants with supervision	Knows that environmental conditions are important, but can't apply knowledge to plant selection	20
Determine correct slope for adequate drainage	Determines minimum degree of slope & direction for proper drainage without assistance	Determines minimum degree of slope & direction for proper drainage with supervision	Can't determine degree of slope, but sees direction necessary for proper drainage	20
Clarify word choice according to audience, topic, and purpose	Clearly describes subject	Gives a correct, but unclear description of subject	Can't express data in clear, descriptive terms	5
Expand vocabulary to fit topic	Uses vocabulary that clearly describes subject material	Uses appropriate vocabulary, but it is not clearly descriptive	Lacks understanding of related vocabulary	5
Estimate and use measurements	Makes appropriate estimates and accurate measurements	Makes appropriate estimates, but takes inaccurate measurements	Doesn't know when an estimate is appropriate or a measurement is necessary	10
Use mental computation when computer and calculator are inappropriate	Computes mentally well and with accuracy	Can do simple mental computations with minor errors	Can't do mental computation with acceptable accuracy	5

Use ratios, proportions, and probabilities in appropriate problem situations	Understands and applies ratios, proportions, and probabilities correctly	Knows the concept of ratios, proportions, and probabilities, but can't always apply them	Doesn't understand the concepts of ratios, proportions, and probabilities, so can't apply them	5
Create and use databases (electronic and other) to collect, organize, and verify data and observations	Completes and uses databases accurately	Provides complete information, but does not compile it in a useful format	Understands concept of databases, but can't compile information	5
Collect, store, retrieve, and manipulate information with available technologies that may range from hand processes up through computer applications	Collects, stores, retrieves, and manipulates information accurately	Collects, stores, retrieves, and manipulates information, but with a low degree of accuracy	Knows the importance of collecting, storing, retrieving, and manipulating information accurately, but can't complete the task	5
Finish Time:		**Score:**		

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.4 Plan Residential Landscape Design***

Terminal Performance Objective (Outcome):

In the school laboratory or actual situation, given a residential site plan, budget (3% of property value), and deadline for submission, the student will complete a landscape design following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

Competency Builders/Pupil Performance Objectives (Criteria):

10.4.7 Select plant and seed varieties to be used

- Student will be able to select plant and seed varieties appropriate for the existing environmental conditions.

10.4.11 Identify the hardscape elements of a landscape design

- Student will be able to correctly identify the hardscape elements of a given landscape design.

Applied Academics Competencies:

COMMUNICATIONS

RM20 Use reference books to find, evaluate, and synthesize information

- Student will be able to use reference books to find, evaluate, and synthesize information to facilitate the research process.

RM9 Read to facilitate content learning

- Student will be able to read to facilitate content learning during the research process.

WS2 Clarify word choice according to audience, topic, and purpose

- Student will be able to clarify word choice according to audience, topic, and purpose to facilitate communication.

MATHEMATICS

M17 Express and apply different types of measurement scales

- Student will be able to accurately express and apply different types of measurement scales to facilitate the planning of different sizes of projects.

E4 Use mental computation when computer and calculator are inappropriate

- Student will be able to use mental computation when computer and calculator are inappropriate relative to assigned landscape design.

SCIENCE

Q11 Use appropriate units for counts and measures

- Student will be able to use appropriate units for counts and measures to facilitate accurate completion of assigned landscape design.

Q12 Create and use databases (electronic and other) to collect, organize, and verify data and observations

- Student will be able to create and use databases (electronic and other) to collect, organize, and verify data and observations to facilitate accurate completion of assigned landscape design.

C13 Collect, store, retrieve, and manipulate information with available technologies that may range from hand processes up through computer applications

- Student will be able to collect, store, retrieve, and manipulate information with available technologies that may range from hand processes up through computer applications relative to assigned landscape design.

Equipment, Supplies, and Other Resources to be Provided:

- drawing board, drafting paper, drafting supplies
- site specifications, family data (including family members, ages, pets), and data indicating the family's wants and needs
- a budget and timeline for completion
- all resources necessary to research material specifications and costs

Preparations Before Assessment Starts:

1. Student must be thoroughly familiar with the "Landscape Design Process."
2. Student must be thoroughly familiar with standard drafting equipment.
3. Student must be thoroughly familiar with landscape design symbolism.
4. Student must be thoroughly familiar with all Principles of Landscape Design.
5. Student must be thoroughly familiar with plant and seed varieties.
6. Student must be thoroughly familiar with hardscape materials and their uses.

Task:
You are a landscape designer who has been given the job of completing a residential landscape design. You will need to follow the "Landscape Design Process" and compile data related to site analysis and environmental conditions used to determine plant and seed selection. You will then determine plant and seed selection, and identify the hardscape elements of the landscape design.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Training	Weight
Select plant and seed varieties to be used	Selects plant and seed varieties to be used with respect to site analysis and environmental conditions without assistance	Selects plant and seed varieties to be used with respect to site analysis and environmental conditions with supervision	Is unable to select plant and seed varieties to be used with respect to site analysis and environmental conditions	30
Identify the hardscape elements of a landscape design	Identifies the hardscape elements of a landscape design with respect to site analysis and environmental conditions without assistance	Identifies the hardscape elements of a landscape design with respect to site analysis and environmental conditions with supervision	Is unable to identify the hardscape elements of a landscape design with respect to site analysis and environmental conditions	30
Use reference books to find, evaluate, and synthesize information	Uses reference books to find, evaluate, and synthesize information	Makes some use of reference books to find, evaluate, and synthesize information	Does not use reference books to find, evaluate, and synthesize information	5
Read to facilitate content learning	Demonstrates ability to read for content through expressed knowledge	Has weak reading skills, but is able to identify useful content	Does not comprehend the content of what was read	5
Clarify word choice according to audience, topic, and purpose	Clearly describes subject	Gives correct description, but it is not always clear	Can't express data in clear, descriptive terms	5
Express and apply different types of measurement scales	Knows how to express and apply different types of measurement scales without assistance	Knows how to express and apply different types of measurement scales with some supervision	Knows different types of measurement scales, but can't apply them	5
Use mental computation when computer and calculator are inappropriate	Computes mentally well and with accuracy	Can do simple mental computations with minor errors	Can't do mental computation with acceptable accuracy	5

Use appropriate units for counts and measures	Uses appropriate units for counts and measures without assistance	Uses appropriate units for counts and measures with minimum supervision	Has weak skills in using appropriate units for counts and measures	5
Create and use databases (electronic and other) to collect, organize, and verify data and observations	Completes and uses databases accurately	Collects information, but it is not compiled in a useful format	Understands concept of databases, but can't compile information	5
Collect, store, retrieve, and manipulate information with available technologies that may range from hand processes up through computer applications	Collects, stores, retrieves, and manipulates information accurately	Collects, stores, retrieves, and manipulates information, but with a low degree of accuracy	Knows the importance of collecting, storing, retrieving, and manipulating information accurately, but can't complete task	5
Finish Time:		**Score:**		

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.4 Plan Residential Landscape Design***

Terminal Performance Objective (Outcome):

In the school laboratory or actual situation, given a residential site plan, budget (3% of property value), and deadline for submission, the student will complete a landscape design following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

Competency Builders/Pupil Performance Objectives (Criteria):

10.4.12 Identify standard drafting equipment and the function of each piece

- Student will be able to correctly identify standard drafting equipment and the function of each piece.

10.4.13 Lay out landscape designs using drafting equipment

- Student will be able to correctly lay out landscape designs using drafting equipment, meeting all Principles of Landscape Design.

10.4.16 Depict existing plant material and objects on a landscape design

- Student will be able to correctly depict existing plant material and objects on a landscape design acceptable to industry standards.

10.4.17 Draw landscape symbols

- Student will be able to draw landscape symbols acceptable to industry standards.

Applied Academics Competencies:

COMMUNICATIONS

RM20 Use reference books to find, evaluate, and synthesize information

- Student will be able to use reference books to find, evaluate, and synthesize information to facilitate the research process.

RM9 Read to facilitate content learning

- Student will be able to read to facilitate content learning during the research process.

MATHEMATICS

M1 Estimate and use measurements

- Student will be able to estimate and use measurements accurately to draw a landscape plan and depict all related objects.

M17 Express and apply different types of measurement scales

- Student will be able to accurately express and apply different types of measurement scales to facilitate the planning of different sizes of projects.

E4 Use mental computation when computer and calculator are inappropriate

- Student will be able to use mental computation when computer and calculator are inappropriate relative to assigned landscape design.

SCIENCE

Q9 Make and read scale drawings, maps, models, and other representations to aid planning and understanding

- Student will be able to make and read scale drawings, maps, models, and other representations to aid planning and understanding relative to accurate completion of assigned landscape design.

Q11 Use appropriate units for counts and measures

- Student will be able to use appropriate units for counts and measures to facilitate accurate completion of assigned landscape design.

Equipment, Supplies, and Other Resources to be Provided:

- drawing board, drafting paper, drafting supplies
- site specifications, family data (including family members, ages, pets), and data indicating the family's wants and needs
- a budget and timeline for completion
- all resources necessary to research material specifications and costs

Preparations Before Assessment Starts:

1. Student must be thoroughly familiar with the "Landscape Design Process."
2. Student must be thoroughly familiar with standard drafting equipment.
3. Student must be thoroughly familiar with landscape design symbolism.

Task:
You are a landscape designer who has been given the job of completing a residential landscape design. You will need to identify and collect standard drafting equipment and demonstrate the function of each piece of equipment. You will need to follow the "Landscape Design Process" while you correctly lay out the landscape design using standard drafting equipment. You will need to correctly depict existing plant material and objects on the landscape design.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Training	Weight
Identify standard drafting equipment and the function of each piece	Knows all standard drafting equipment and can properly use each item without assistance	Knows all standard drafting equipment and can properly use each item with minimum supervision	Knows all standard drafting equipment, but not its use	15
Lay out landscape designs using drafting equipment	Can accurately lay out landscape designs using drafting equipment without assistance	Can accurately lay out landscape designs using drafting equipment under close supervision	Doesn't use equipment correctly; therefore, can't accurately lay out design	20
Depict existing plant material and objects on a landscape design	Can accurately depict existing plant material and objects on a landscape design without assistance	Can accurately depict existing plant material and objects on a landscape design with close supervision	Has difficulty depicting existing plant material and objects on a landscape design	15
Draw landscape symbols	Knows how to draw landscape symbols without assistance	Knows how to draw landscape symbols with instructor supervision	Knows what landscape symbols are	15
Use reference books to find, evaluate, and synthesize information	Uses reference books to find, evaluate, and synthesize information	Makes some use of reference books to find, evaluate, and synthesize information	Does not use reference books to find, evaluate, and synthesize information	5
Estimate and use measurements	Makes appropriate estimates and accurate measurements	Makes appropriate estimates, but takes some inaccurate measurements	Doesn't know when an estimate is appropriate or a measurement is necessary	5

Express and apply different types of measurement scales	Knows how to express and apply different types of measurement scales without assistance	Knows how to express and apply different types of measurement scales with some supervision	Knows different types of measurement scales, but not how to apply them	5
Use mental computation when computer and calculator are inappropriate	Computes mentally well and with accuracy	Can do simple mental computations with minor errors	Can't do mental computation with acceptable accuracy	5
Make and read scale drawings, maps, models, and other representations to aid planning and understanding	Knows how to make and read scale drawings, maps, models, and other representations to aid planning and understanding without assistance	Knows how to make and read scale drawings, maps, models, and other representations to aid planning and understanding with supervision	Has weak skills in making and reading scale drawings, maps, models, and other representations to aid planning and understanding	10
Use appropriate units for counts and measures	Uses appropriate units for counts and measures without assistance	Uses appropriate units for counts and measures with minimum supervision	Has weak skills in using appropriate units for counts and measures	5
Finish Time:		**Score:**		

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.4 Plan Residential Landscape Design***

Terminal Performance Objective (Outcome):

In the school laboratory or actual situation, given a residential site plan, budget (3% of property value), and deadline for submission, the student will complete a landscape design following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

Competency Builders/Pupil Performance Objectives (Criteria):

10.4.9 Calculate square footage of lawn

- Student will be able to accurately calculate the square footage of lawn for given landscape design project.

10.4.10 Calculate cubic measurements of soil

- Student will be able to correctly calculate the cubic measurements of soil for given landscape design project.

10.4.20 Draw plan to scale

- Student will be able to accurately draw plan to scale.

10.4.21 Design residential plantings

- Student will be able to correctly design residential plantings following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

Applied Academics Competencies:

COMMUNICATIONS

OS1 Refine oral communication skills (e.g., voice modulation, eye contact, body language)

- Student will be able to refine oral communication skills to facilitate topic presentation.

OM9 Gather and assess information for speaking

- Student will be able to gather and assess information for speaking to facilitate communication.

OM10 Communicate orally to inform and persuade

- Student will be able to communicate orally to inform and persuade to facilitate communication.

MATHEMATICS

M13 Compute total sales from a variety of items

- Student will be able to accurately compute total sales from a variety of items relative to assigned landscape design.

M18 Determine area and volume

- Student will be able to accurately determine area and volume relative to assigned landscape design.

SCIENCE

A29 Design management plans for natural and human-altered environments (e.g., woodlots, patios, lots, lawns, farmlands, forests)

- Student will be able to design management plans for natural and human-altered environments relative to assigned landscape design.

Equipment, Supplies, and Other Resources to be Provided:

- drawing board, drafting paper, drafting supplies
- site specifications, family data (including family members, ages, pets), and data indicating the family's wants and needs
- a budget and timeline for completion
- all resources necessary to research material specifications and costs

Preparations Before Assessment Starts:

1. Student must be thoroughly familiar with the "Landscape Design Process."
2. Student must be thoroughly familiar with standard drafting equipment.
3. Student must be thoroughly familiar with landscape design symbolism.
4. Student must be thoroughly familiar with all Principles of Landscape Design.
5. Student must be thoroughly familiar with plant and seed varieties.
6. Student must be thoroughly familiar with hardscape materials and their uses.
7. Student must be thoroughly familiar with mathematical formulas for area and volume.

Task:
You are a landscape designer who has been given the job of completing a residential landscape design. You will need to follow the "Landscape Design Process" and compile all necessary information including problem, data, analysis, maintenance, and conclusion. The landscape design should increase the value, beauty, and use of the property. You will need to compute the total sale price of your project including materials, labor, mark-up and tax. Your total project should be within +/- 10% of the given budget. Upon completion of the project you will present your landscape design to the class, including explanations, descriptions, pricing, and maintenance.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Training	Weight
Calculate square footage of lawn	Accurately calculates square footage of lawn without assistance	Accurately calculates square footage of lawn with supervision	Can't accurately calculate square footage of lawn	10
Calculate cubic measurements of soil	Correctly calculates cubic measurements of soil without assistance	Correctly calculates cubic measurements of soil with supervision	Can't correctly calculate cubic measurements of soil	10
Draw plan to scale	Accurately draws plan to scale without assistance	Accurately draws plan to scale with supervision	Can't accurately draw plan to scale	20
Design residential plantings	Designs residential plantings following all Principles of Design without assistance	Designs residential plantings following all Principles of Design with supervision	Can't design residential plantings following the Principles of Design	30
Refine oral communication skills (e.g., voice modulation, eye contact, body language)	Uses excellent oral communication skills of voice modulation, eye contact and body language	Has good oral communication of content, but lacks interest of voice modulation, eye contact and body language	Is weak in oral communication skills	5
Gather and assess information for speaking	Completely and accurately gathers and assesses information for speaking	Gathers and assesses most information for speaking	Lacks skills to gather and assess information for speaking	5
Communicate orally to inform and persuade	Communicates orally to accurately inform and thoroughly persuade	Communicates orally to inform and persuade	Lacks oral communication skills	5
Compute total sales from a variety of items	Computes total sales from a variety of items without assistance	Computes total sales from a variety of items with supervision	Can't compute total sales from a variety of items	5

Determine area and volume	Correctly determines area and volume without assistance	Correctly determines area and volume with supervision	Can't correctly determine area and volume	5
Design management plans for natural and human-altered environments (e.g., woodlots, patios, lots, lawns, farmlands, forests)	Designs management plans for natural and human-altered environments without assistance	Designs management plans for natural and human-altered environments with supervision	Can't design management plans for natural and human-altered environments	5
Finish Time:		**Score:**		

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Program: Horticulture
Unit: 10. Turf and Landscape Operations

Competency: ***10.4 Plan Residential Landscape Design***

Terminal Performance Objective (Outcome):

In the school laboratory or actual situation, given a residential site plan, budget (3% of property value), and deadline for submission, the student will complete a landscape design following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

Competency Builders/Pupil Performance Objectives (Criteria):

10.4.18 Locate focal point

- Student will be able to correctly locate the focal point, meeting all Principles of Landscape Design.

10.4.23 Design outdoor privacy areas

- Student will be able to correctly design outdoor privacy areas following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

10.4.25 Design public areas

- Student will be able to correctly design public areas following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

10.4.27 Design service areas

- Student will be able to correctly design service areas following an industry-accepted "Landscape Design Process," meeting all Principles of Landscape Design.

Applied Academics Competencies:

COMMUNICATIONS

RM20 Use reference books to find, evaluate, and synthesize information

- Student will be able to use reference books to find, evaluate, and synthesize information to facilitate the research process.

MATHEMATICS

M1 Estimate and use measurements

- Student will be able to estimate and use measurements accurately to draw a landscape plan and depict all related objects.

M17 Express and apply different types of measurement scales

- Student will be able to accurately express and apply different types of measurement scales to facilitate the planning of different sizes of projects.

SCIENCE

Q9 Make and read scale drawings, maps, models, and other representations to aid planning and understanding

- Student will be able to make and read scale drawings, maps, models, and other representations to aid planning and understanding relative to accurate completion of assigned landscape design.

Equipment, Supplies, and Other Resources to be Provided:

- drawing board, drafting paper, drafting supplies
- site specifications, family data (including family members, ages, pets), and data indicating the family's wants and needs
- a budget and timeline for completion
- all resources necessary to research material specifications and costs

Preparations Before Assessment Starts:

1. Student must be thoroughly familiar with the "Landscape Design Process."
2. Student must be thoroughly familiar with standard drafting equipment.
3. Student must be thoroughly familiar with landscape design symbolism.
4. Student must be thoroughly familiar with all Principles of Landscape Design.

Task:
You are a landscape designer who has been given the job of completing a residential landscape design. You will need to follow the "Landscape Design Process" and compile all necessary information including problem, data, analysis, maintenance, and conclusion. You first need to identify the focal point according to the Principles of Landscape Design. Next you will design the outdoor privacy area, the public area, and the service area, meeting all Principles of Landscape Design.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	**Excellent**	**Skilled**	**Training**	**Weight**
Locate focal point	Locates focal point according to the Principles of Landscape Design without assistance	Locates focal point according to the Principles of Landscape Design with supervision	Is unable to locate focal point according to the Principles of Landscape Design	20
Design outdoor privacy areas	Designs outdoor privacy area according to the Principles of Landscape Design without assistance	Designs outdoor privacy area according to the Principles of Landscape Design with supervision	Is unable to design outdoor privacy area according to the Principles of Landscape Design	20
Design public areas	Designs public area according to the Principles of Landscape Design without assistance	Designs public area according to the Principles of Landscape Design with supervision	Is unable to design public area according to the Principles of Landscape Design	20
Design service areas	Designs service area according to the Principles of Landscape Design without assistance	Designs service area according to the Principles of Landscape Design with supervision	Is unable to design service area according to the Principles of Landscape Design	20
Use reference books to find, evaluate, and synthesize information	Uses reference books to find, evaluate, and synthesize information	Makes some use of reference books to find, evaluate, and synthesize information	Does not use reference books to find, evaluate, and synthesize information	5
Estimate and use measurements	Makes appropriate estimates and accurate measurements	Makes appropriate estimates, but takes some inaccurate measurements	Doesn't know when an estimate is appropriate, or a measurement is necessary	5

Express and apply different types of measurement scales	Knows how to express and apply different types of measurement scales without assistance	Knows how to express and apply different types of measurement scales with some supervision	Knows different types of measurement scales, but not how to apply them	5
Make and read scale drawings, maps, models, and other representations to aid planning and understanding	Can make and read scale drawings, maps, models, and other representations to aid planning and understanding without assistance	Can make and read scale drawings, maps, models, and other representations to aid planning and understanding with some supervision	Can't make and read scale drawings, maps, models, and other representations to aid planning and understanding without constant supervision	5
Finish Time:		**Score:**		

Portions of this assessment were submitted by Douglas A. Young, Live Oaks Career Development Campus, Milford.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.9 Establish Turf by Seeding***

Terminal Performance Objective (Outcome):

When given a specific lawn area, the student will be able to prepare and sow the lawn area with a 95% level of accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.9.21 Control weedy grasses

10.9.22 Grade the soil site

10.9.23 Prepare the soil for planting

10.9.24 Apply lime and fertilizer

10.9.25 Plant the seedbed

10.9.26 Apply a starter fertilizer

10.9.27 Rake the seedbed

10.9.28 Mulch the seedbed

10.9.29 Water the seedbed

Applied Academics Competencies:

COMMUNICATIONS

RS1	Exhibit knowledge of language structure
RS6	Apply knowledge of language structure to reading
RS7	Explain why there may be more than one interpretation of reading selections
RMC3	Read to clarify personal thinking and understanding
RMC20	Use reference books to find, evaluate, and synthesize information
RA5	Develop and apply understanding of the interrelationship of concepts
RM2	Read to facilitate learning across curriculum

MATHEMATICS

M1	Estimate and use measurements
M9	Construct and interpret maps, tables, charts, and graphs as they relate to real-world mathematics
M17	Express and apply different types of measurement scales
M18	Determine area and volume

Equipment, Supplies, and Other Resources to be Provided:

Bobcat	sprayer
turfgrass seed	lime
fertilizer	straw
rakes	water hose and sprinkler
herbicide	organic soil amendments

Preparations Before Assessment Starts:

Students will be provided instruction in

1. preparing the site
2. soils
3. rough and final grading techniques
4. seeding
5. equipment operation

Task:

You will be given an actual lawn site that needs to be seeded. Prior to seeding, you will need to rough grade the site; add soil amendments, lime and/or fertilizer; and final grade the site.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Improvement	Weight
Control weedy grasses	Able to identify weedy grasses and select and apply an appropriate herbicide	Able to identify weedy grasses and select an appropriate herbicide	Unable to identify weedy grasses or to select an appropriate herbicide	
Grade the soil site	Can grade the site establishing a 2-3% slope away from the buildings	Can grade the site establishing a 4-5% slope away from the buildings	Has difficulty grading the site with less than a 5% slope away from the buildings, or has slope directed toward the buildings	

Prepare the soil for planting	Can identify the existing soil type and add correct amounts of appropriate soil amendments to create an ideal seedbed	Can add appropriate soil amendments to create an ideal seedbed	Cannot add the appropriate soil amendments to create an ideal seedbed	
Apply lime and fertilizer	Can interpret soil test results and apply appropriate amounts of lime/fertilizer uniformly	Can apply appropriate amounts of lime/fertilizer uniformly	Cannot apply appropriate amounts of lime/fertilizer uniformly	
Plant the seedbed	Can calibrate amount of seed to apply and sow it uniformly. Rakes and rolls the seedbed lightly	Can apply and sow seed uniformly. Rakes and rolls the seedbed lightly.	Has difficulty applying and sowing seed uniformly. Rakes the seedbed lightly.	
Apply a starter fertilizer	Can calibrate and apply a starter fertilizer to manufacturer's specifications and rake it into the soil	Can apply a starter fertilizer to manufacturer's specifications and rake it into the soil	Has difficulty applying a starter fertilizer to manufacturer's specifications	
Mulch the seedbed	Can apply appropriate mulch at specified rate with 95% accuracy	Can apply appropriate mulch at specified rate with 75-94% accuracy	Can apply appropriate mulch at specified rate with less than 75% accuracy	
Water the seedbed	Can water seedbed uniformly with 95% accuracy	Can water seedbed uniformly with 75-94% accuracy	Can water seedbed uniformly with less than 75% accuracy	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Jim Scott, Dublin, Ohio.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.9 Establish Turf and Landscape***

Terminal Performance Objective (Outcome):

Given a landscape plan, the student will plant the perennials named on plan with 95% accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.9.2 Follow landscape plan

10.9.5 Plant annual and perennial plants

10.9.8 Plant drought-resistant and disease-resistant cultivars

Applied Academics Competencies:

COMMUNICATIONS

RS1 Exhibit knowledge of language structure

RS6 Apply knowledge of language structure to reading

RM20 Use reference books to find, evaluate, and synthesize information

MATHEMATICS

D1 Organize data into tables, charts, and graphs

M1 Estimate and use measurements

Equipment, Supplies, and Other Resources to be Provided:

architect scale, landscape plan, perennials, planting bed, shovels, tape ruler

Preparations Before Assessment Starts:

Task: You have been given a landscape plan for a perennial garden at a residential house. It is your job to incorporate all the perennials into the garden.	
Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	**Excellent**	**Skilled**	**Still Catching On**	**Weight**
Follow landscape plan	Can read plan and lay out plants to exact location indicated	Has some difficulty reading a landscape plan; can lay out plants within a foot of proper location	Has great difficulty reading a landscape plan; is off by five feet or more when planting	
Plant annual and perennial plants	Is proficient in planting perennials at proper depth, in proper light exposure, and in proper soil pH	Is proficient in planting perennials at proper depth; struggles with the environmental requirements for the plants	Usually plants the perennials either too deep or too shallow	
Plant drought-resistant and disease-resistant cultivars	Knows how to choose drought-resistant and disease-resistant cultivars and when to use them in the design	Knows about choosing drought-resistant cultivars, but struggles with disease-resistant cultivars	Has constant struggle identifying drought-resistant and disease-resistant cultivars; needs reference books to help locate them	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Debra J. Woodworth, Mentor High School, Mentor.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.9 Establish Turf and Landscape***

Terminal Performance Objective (Outcome):

The student will demonstrate the basic procedure for planting shrubs (ball and burlap).

Competency Builders/Pupil Performance Objectives (Criteria):

10.9.1 Follow general safety precautions related to turf and landscape operation

10.6.5 Determine planting depths

10.6.6 Determine planting times

10.6.11 Select mulch variety

10.7.5 Incorporate soil amendments

10.9.6 Plant shrubs (ball & burlap)

10.9.14 Water-in plant material

10.9.17 Apply mulch

10.10.15 Apply dry fertilizer

10.9.19 Do final clean-up

Applied Academics Competencies:

COMMUNICATIONS

MATHEMATICS

Equipment, Supplies, and Other Resources to be Provided:

balled and burlapped shrub
spades
shovels
pick
wheelbarrow
tape measure
water hose
knife
fertilizer
mulch
soil amendment
pruning tool (if needed)

Preparations Before Assessment Starts:

- Provide student with proper plant material and equipment.
- Give student a checklist of expectations.

Task:

As a student you wll perform all the basic procedures for properly planting a ball and burlap shrub. Activities will include: digging the hole, placing the plant, backfilling, fertilizing, mulching, watering, and clean-up.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Follow general safety precautions related to Turf & Landscape Industry	Discussed safety precautions first, then observed them before and during installation	Observed safety precautions as they became evident	Did not address safety issues	
Determine planting times	Observed proper planting times and followed them for the installation	Discussed planting times when asked about them	Did not observe planting times	
Determine planting depth	Established planting depth prior to installation and checked it during installation	Checked planting depth during installation	Did not address or check planting depth	
Incorporate soil amendments	Added amendments at the proper rate and thoroughly mixed them before backfilling	Added soil amendments but did not measure amounts	Did not add soil amendments	
Apply dry fertilizer	Applied dry fertilizer at the proper rate and in proper location – around the drip line	Applied dry fertilizer at the proper rate	Did not make proper application of dry fertilizer	
Select mulch	Selected mulch to match the surrounding plantings	Selected appropriate mulch for the planting	Did not select appropriate mulch for the planting	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Apply mulch	Applied mulch to proper depth and with uniformity	Applied mulch at proper depth	Applied mulch poorly or not at all	
Final clean-up	Cleaned site and disposed of debris properly; returned site to original or near-original condition	Cleaned worksite adequately after completion of task	Gave little or no evidence of clean-up	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Doug Beck, Coldwater High School, Coldwater.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.9 Establish Turf and Landscape***

Terminal Performance Objective (Outcome):

The student will demonstrate the basic procedure for planting trees (ball and burlap).

Competency Builders/Pupil Performance Objectives (Criteria):

10.9.1 Follow general safety precautions related to turf and landscape operation

10.6.5 Determine planting depths

10.6.6 Determine planting times

10.6.11 Select mulch variety

10.7.5 Incorporate soil amendments

10.9.10 Plant trees (ball & burlap)

10.9.13 Stake and/or guy trees

10.9.14 Water-in plant material

10.9.17 Apply mulch

10.10.15 Apply dry fertilizer

10.9.19 Do final clean-up

Applied Academics Competencies:

COMMUNICATIONS

MATHEMATICS

Equipment, Supplies, and Other Resources to be Provided:

balled and burlapped material
spades
shovels
pick
rake
wheelbarrow
ball cart
tape measure
water hose
knife
fertilizer
mulch
soil amendments
tree wrap
staking material
pruning tools

Preparations Before Assessment Starts:

- Provide student with proper plant material and equipment.
- Give student a checklist of expectations.

Task:

As a student you will perform all the basic procedures for properly planting a ball and burlap tree. Activities will include: digging the hole, placing the plant, adding the proper soil amendments, backfilling, watering, mulching, staking and clean-up.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	**Excellent**	**Skilled**	**Needs Help**	Weight
Follow general safety precautions related to Turf & Landscape Industry	Discussed safety precautions first, then observed them before and during installation	Observed safety precautions as they became evident	Did not address safety issues	
Determine planting times	Observed proper planting times and followed them for the installation	Discussed planting times when asked about them	Did not observe planting times	
Determine planting depth	Established planting depth prior to installation and checked it during installation	Checked planting depth during installation	Did not address or check planting depth	
Incorporate soil amendments	Added amendments at the proper rate and thoroughly mixed them before backfilling	Added soil amendments but did not measure amounts	Did not add soil amendments	
Apply dry fertilizer	Applied dry fertilizer at the proper rate and in proper location – around the drip line	Applied dry fertilizer at the proper rate	Did not make proper application of dry fertilizer	
Select mulch	Selected mulch to match the surrounding plantings	Selected appropriate mulch for the planting	Did not select appropriate mulch for the planting	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Apply mulch	Applied mulch to proper depth and with uniformity	Applied mulch at proper depth	Applied mulch poorly or not at all	
Stake and/or guy tree	Staked and/or guyed tree properly and chose proper staking method for tree size	Staked and/or guyed tree properly	Did not give attention to selection of proper staking method	
Final clean-up	Cleaned site and disposed of debris properly; returned site to original or near-original condition	Cleaned worksite adequately after completion of task	Gave little or no evidence of clean-up	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Doug Beck, Coldwater High School, Coldwater.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.10 Fertilize the Lawn***

Terminal Performance Objective (Outcome):

Given fertilizer and a lawn area, the student will be able to determine the application pattern and methods, mix the fertilizer, and calibrate the fertilizer application equipment to a 95% level of accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.10.10 Determine application pattern

10.10.11 Mix fertilizer solutions

10.10.12 Identify application methods

10.10.16 Calibrate fertilizer application equipment

10.10.21 Comply with prescribed chemical re-entry times

10.10.23 Follow established safety procedures for storing and handling chemicals and fertilizers

10.10.24 Observe safety precautions when handling fertilizer spills

10.10.25 Follow procedures for personal cleanup after handling fertilizer

Applied Academics Competencies:

COMMUNICATIONS

RS1	Exhibit knowledge of language structure
RS6	Apply knowledge of language structure to reading
RS7	Explain why there may be more than one interpretation of reading selections
RMC3	Read to clarify personal thinking and understanding
RMC20	Use reference books to find, evaluate, and synthesize information
RA5	Develop and apply understanding of the interrelationship of concepts

MATHEMATICS

NR2	Estimate answers, compute, and solve problems involving real numbers
M1	Estimate and use measurements
M4	Understand and apply measurement concepts of distance-rate-time problems and acceleration problems
M8	Establish ratios with and without common units
M9	Construct and interpret maps, tables, charts, and graphs as they relate to real-world mathematics
M18	Determine area and volume
G3	Apply Pythagorean theorem

Equipment, Supplies, and Other Resources to be Provided:
fertilizers
types of spreaders

Preparations Before Assessment Starts:
The students will be provided instruction In
1. safety procedures for handling, use, and storage of chemicals and fertilizers
2. proper techniques for mixing fertilizers
3. proper application methods and patterns
4 calibration techniques

Task:
You will apply the appropriate amount of fertilizer, using the appropriate application method and pattern, in a designated lawn area of the school land laboratory or in an actual job site.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Skilled	Needs Improvement		Weight
Determine application pattern	Can apply fertilizer uniformly using a north-south/east-west pattern	Has difficulty applying fertilizer uniformly using a north-south/east-west pattern		
Mix fertilizer solutions	Can mix fertilizer solutions according to manufacturer's specifications	Has difficulty mixing fertilizer solutions according to manufacturer's specifications		
Identify application methods	Can identify application methods and select appropriate method for the situation	Can identify application methods		

Calibrate fertilizer application equipment	Can calibrate fertilizer application equipment according to manufacturer's recommendations and/or according to need indicated on soil test analysis	Has difficulty calibrating fertilizer application equipment according to manufacturer's recommendations and/or according to need indicated on soil test analysis		
Comply with prescribed chemical re-entry times	Identifies re-entry times and complies with recommendations	Identifies re-entry times but does not comply with recommendations		
Follow established safety procedures for storing and handling chemicals and fertilizers	Identifies and follows established safety procedures for storing and handling chemicals and fertilizers	Cannot identify and follow established safety procedures for storing and handling chemicals and fertilizers		
Observe safety precautions when handling fertilizer spills	Cleans up fertilizer spills using safety precautions identified by the manufacturer	Struggles to clean up fertilizer spills using safety precautions identified by the manufacturer		
Follow procedures for personal cleanup after handling fertilizer	Identifies and follows procedures for personal cleanup after handling fertilizer, as listed on the manufacturer's product, or by using techniques described in the state's pesticide certification manual	Can identify but has difficulty following procedures for personal cleanup after handling fertilizer, as listed on the manufacturer's product, or by using techniques described in the state's pesticide certification manual		
Finish Time:		**Score:**		

Portions of this assessment were submitted by Jim Scott, Dublin, Ohio.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.11 Maintain Landscape Plants***

Terminal Performance Objective (Outcome):
The student will demonstrate the proper procedure for maintaining a shrub bed.

Competency Builders/Pupil Performance Objectives (Criteria):

10.11.2 Cultivate plants

10.11.3 Water plants

10.11.4 Check for symptoms of overwatering and underwatering

10.11.5 Apply mulch

10.11.10 Remove fallen leaves

10.11.12 Compost debris

Applied Academics Competencies:
COMMUNICATIONS

MATHEMATICS
Determine square feet and volume measurement

Equipment, Supplies, and Other Resources to be Provided:
water hose
hoe
mulch
leaf rake
wheelbarrow & chipper/shredder
tape measure
hand trowel
shovel
garden rake

Preparations Before Assessment Starts:
- Students will be trained to identify weeds.
- Students will be trained to properly water landscape plants.
- Students will be trained to determine the amount of mulch needed for a given area.
- Students will be trained on the safe use of a chipper/shredder.

Task:
As a student, you have been assigned to clean up a shrub bed that has been planted for one year. Weeds are growing in the bed and old leaves have blown under the shrubs. You need to determine how much mulch is needed to cover the bed to a 3" depth. You will also determine if the plants need to be watered. If so, you will water them properly. You will make sure that all the debris from the bed is composted.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Cultivate plants	Removed all weeds by the roots; dug out deep-rooted weeds	Removed all weeds; did not dig out deep-rooted weeds	Pulled tops off weeds; chopped tops off deep-rooted weeds	
Remove fallen leaves	Removed all leaves around, underneath, and in branches of shrubs	Removed all leaves around shrubs; left some under shrubs and in branches	Removed leaves around shrubs; left all leaves under shrubs and in branches	
Check symptoms of overwatering and underwatering Water plants	Checked all plants Determined watering needs; watered plants properly	Checked several plants Watered plants properly	Did not check plants Watered plants improperly	
Apply mulch	Determined proper amount of mulch; spread it evenly to proper depth	Slightly over- or underestimated amount of mulch needed; mostly, spread mulch evenly to proper depth	Did not determine proper amount of mulch; did not spread it evenly	
Compost plant debris	Operated chipper/shredder in safe manner; shredded all debris and piled it properly for composting	Operated chipper/shredder in safe manner; shredded most debris, but did not pile it all for composting	Did not shred debris; did not pile it properly for composting	

Finish Time:		**Score:**	

Portions of this assessment were submitted by Jerry Schwochow, Vanguard Career Center, Fremont.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.11 Maintain Landscape Plants***

Terminal Performance Objective (Outcome):

The student will demonstrate the proper procedure for pruning landscape plants.

Competency Builders/Pupil Performance Objectives (Criteria):

10.11.1 Follow general safety precautions related to plant maintenance

10.11.7 Shear hedges

10.11.8 Prune shrubs

10.11.9 Prune trees

10.11.11 Remove old flowers

Applied Academics Competencies:

COMMUNICATIONS

MATHEMATICS

M1 Estimate and use measurements

Equipment, Supplies, and Other Resources to be Provided:

hand pruners
lopping shears
pole pruner
pruning saw
hedge shears
leaf rake
wheelbarrow

Preparations Before Assessment Starts:

- Students will be trained in the proper and safe use of pruning tools.
- Students will be trained to make the proper pruning cuts.
- Students will be trained to select the proper pruning tool(s) for the task.

Task:
As a student, you have been asked to prune a hedge, deciduous shrub, and deciduous ornamental tree and to remove dead flowers from a rhododendron. The hedge and shrub are to be reduced in height and width by 6" and thinned out. The ornamental tree is to have water sprouts, sucker growth, and crossing branches removed. When the task is completed, the debris must be removed from the area and properly disposed of.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Follow general safety precautions related to plant maintenance	Demonstrated all safety precautions in a timely fashion	Was slow to demonstrate safety precautions	Did not demonstrate safety precautions needed for the task	
Shear hedges	Sheared hedge to proper size, thinned hedge properly, cleaned up debris, and disposed of it properly	Did not shear to proper height, thinned most of the hedge, left some debris	Did not shear hedge to proper size, did not thin the hedge, left most of the debris	
Prune shrubs	Pruned shrub to proper size, thinned shrub properly, cleaned up debris, and disposed of it properly	Pruned shrub to proper width, but not height, thinned most of the shrub, left some debris	Did not prune to proper size, left most of the debris	
Prune trees	Removed all suckers, water sprouts, and crossing branches; cleaned area properly	Left some suckers, water sprouts, and crossing branches; left some debris	Left most suckers, water sprouts, and crossing branches; did not clean area properly	
Remove old flowers	Removed all dead flowers, did not damage new growth buds, and cleaned area properly	Removed all dead flowers, but damaged a few new growth buds; cleaned area properly	Did not remove all dead flowers; damaged many new growth buds; did not clean area properly	

Finish Time:		**Score:**	

Portions of this assessment were submitted by Jerry Schwochow, Vanguard Career Center, Fremont.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.11 Maintain Landscape Plants***

Terminal Performance Objective (Outcome):

The student will properly dig out and replant bulbs, corms and tubers

Competency Builders/Pupil Performance Objectives (Criteria):

10.11.13 Transplant bulbs, corms and tubers

Applied Academics Competencies:

COMMUNICATIONS

Read planting depth charts

MATHEMATICS

M1 Estimate and use measurements

Equipment, Supplies, and Other Resources to be Provided:

shovel
bulb planter
bulbs
corms
tubers
wheelbarrow
garden rake
garden fork

Preparations Before Assessment Starts:

- Students will be trained to properly dig and divide bulbs and to transplant them at the correct depth.
- Students will be trained to remove corms and tubers from winter storage and to divide and plant them.

Task:
As a student, you have obtained a job from a local resident to maintain a spring and summer flower bed. This bed has 50 daffodil bulbs that were planted eight years ago. The bulbs need to be dug up and divided, then replanted. The resident also has 30 gladiolus corms and 20 dahlia tubers that need to be divided and planted in the bed.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Transplant bulbs	Dug up all bulbs without injuring them; separated and replanted them at proper depth	Dug up all bulbs with few being injured; separated and replanted them properly	Dug up 40 bulbs and injured many; did not separate them properly; did not replant them at proper depth	
Transplant corms	Divided all 30 corms properly and replanted them at proper depth	Divided all 30 corms properly and replanted them—some not at proper depth	Did not divide all corms properly; replanted many at improper depth	
Transplant tubers	Divided all 20 dahlia tubers properly and replanted them at proper depth	Divided 18 tubers properly and replanted most of them at proper depth	Divided 10 tubers properly and replanted most of them at improper depth	

Finish Time:		**Score:**	

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.11 Maintain Landscape Plants***

Terminal Performance Objective (Outcome):

The student will demonstrate proper care and maintenance of plants on a trellis or arbor.

Competency Builders/Pupil Performance Objectives (Criteria):

10.11.14 Maintain plants on arbors and trellises

Applied Academics Competencies:

COMMUNICATIONS

MATHEMATICS

M1 Estimate and use measurements

Equipment, Supplies, and Other Resources to be Provided:

pruning tools
plastic tie strips
fertilizer

Preparations Before Assessment Starts:

- Students will be trained in attaching vines to a trellis or arbor.
- Students will be trained to prune plants on a trellis or arbor.
- Students will be trained to calculate appropriate amounts of fertilizer for plants.

Task:
As a student, you have been assigned to maintain a clematis growing on a trellis. The plant has not been pruned or fertilized for several years. You are to prune the clematis to the proper height and supply the plant with the correct amount of fertilizer.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Prune plants on a trellis	Removed all dead vines, thinned the plant properly, and pruned it back to proper height	Removed all dead vines and pruned the plant back to proper height	Removed some dead vines and left some; did not prune plant to proper height	
Attach vines to a trellis and fertilize	Properly attached all vines to trellis and applied correct amount of fertilizer	Did not properly attach all vines to trellis; applied correct amount of fertilizer	Did not properly attach all vines to trellis; applied incorrect amount of fertilizer	
Finish Time:		**Score:**		

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.11 Maintain Landscape Plants***

Terminal Performance Objective (Outcome):
The student will demonstrate the proper procedure for staking a tree.

Competency Builders/Pupil Performance Objectives (Criteria):
10.11.15 Stake trees

Applied Academics Competencies:
COMMUNICATIONS

MATHEMATICS

Equipment, Supplies, and Other Resources to be Provided:
tree stakes
wire
rubber hose
sledge hammer
wire cutters

Preparations Before Assessment Starts:
Students will be thoroughly trained in selecting the proper methods of staking trees.

Task:
As a student, you have been assigned to straighten and stake a young tree that has been planted for two months. You must straighten the tree properly and select the appropriate staking method. The tree has a trunk diameter of 2.5 inches.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Stake and straighten tree	Straightened the tree and staked it using the appropriate method	Straightened the tree and staked it properly	Staked the tree	

Finish Time:		**Score:**	

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.11 Maintain Landscape Plants***

Terminal Performance Objective (Outcome):

The student will demonstrate the proper procedure for protecting plants against adverse weather and for overwintering container plants

Competency Builders/Pupil Performance Objectives (Criteria):

10.11.16 Provide plants with protection against adverse weather

10.11.17 Perform overwintering tasks for container-grown plants

Applied Academics Competencies:

COMMUNICATIONS

MATHEMATICS

Equipment, Supplies, and Other Resources to be Provided:

aged wood chips
shredded mulch
pruning shears
chicken wire fencing
fence post
wheelbarrow

Preparations Before Assessment Starts:

Students will be thoroughly trained in winterizing plants in preparation for winter.

Task:
As a student, you are responsible for protecting 10 rose bushes against winter weather conditions. You are also to prepare 50 container-grown deciduous shrubs for winter weather and to protect them from possible animal damage.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Protect plants against adverse weather conditions	Pruned roses back to proper height; placed wood chips at proper depth around roses	Pruned roses back to proper height; placed wood chips around roses	Pruned some of the roses back to proper height; did not place wood chips properly around roses	
Perform overwintering tasks for container-grown plants	Moved plants to protected area; covered them to proper depth with wood chips; placed chicken wire fence securely around plants	Moved plants to protected area; covered them to proper depth with wood chips; did not place chicken wire fence securely around plants	Moved plants to protected area; placed wood chips around plants	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Jerry Schwochow, Vanguard Career Center, Fremont.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.12 Maintain Turfgrasses***

Terminal Performance Objective (Outcome):

Given a specified lawn area, the student will be able to maintain the turfgrass as listed in the criteria of the performance assessment.

Competency Builders/Pupil Performance Objectives (Criteria):

10.12.1 Follow general safety precautions related to turfgrass maintenance

10.12.2 Water turf

10.12.3 Aerate turf

10.12.10 Mow turf

10.12.14 Dethatch turf

10.12.15 Renovate turf

Applied Academics Competencies:

COMMUNICATIONS

RS1 Exhibit knowledge of language structure

RS6 Apply knowledge of language structure to reading

RS7 Explain why there may be more than one interpretation of reading selections

RMC3 Read to clarify personal thinking and understanding

RMC12 Use reading as a possible problem-solving strategy to clarify personal thinking and understanding

RMC20 Use reference books to find, evaluate, and synthesize information

RA1 Select and read material for personal enjoyment and information

RA5 Develop and apply understanding of the interrelationship of concepts

OM3 Be involved in individual, small-group, and whole-group language activities

MATHEMATICS

M1 Estimate and use measurements

Equipment, Supplies, and Other Resources to be Provided:

hose and sprinklers
verticutter
aerator
mowers
grass trimmers and edgers
rakes
seed

Preparations Before Assessment Starts:

Students will be provided instruction in
1. mowing techniques and procedures
2. dethatching, aerating, and renovating procedures and techniques
3. safe operation of various pieces of equipment

Task:

You will work as a member of a group. Your group will be assigned a specific area of the school land laboratory to maintain the turfgrass in this specified area. Your group will demonstrate the proper techniques of watering, aerating, mowing, dethatching, and renovating turf. This activity will be conducted over an extended period of time (9–18 weeks).

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Improvement	Weight
Follow general safety precautions	Can identify and follow safety precautions and can identify potential safety hazards	Can identify and follow safety precautions	Can identify safety precautions	
Water turf	Can properly apply water to turf at the recommended rate	Can properly apply water to turf	Struggles to properly apply water to turf	
Aerate turf	Can properly adjust and operate an aerator to aerate the turf	Can properly operate an aerator to aerate the turf	Has difficulty operating an aerator properly to aerate the turf	

Mow turf	Can select appropriate cutting height for the turfgrass variety and mows the turf using an appropriate pattern	Can adjust the mower's cutting height as instructed and mows the turf using an appropriate pattern	Cannot adjust the mower's cutting height and mows the turf in the same pattern used at last mowing	
Dethatch turf	Can adjust verticutter to the appropriate depth and properly dethatch the turf	Can operate verticutter and properly dethatch the turf	Has difficulty operating verticutter and cannot properly dethatch the turf	
Renovate turf	Can renovate turf as specified in *Ohio Certified Nursery Technician Landscape Training Manual*	Can renovate turf as specified in *Ohio Certified Nursery Technician Landscape Training Manual* with 90% accuracy	Can renovate turf as specified in *Ohio Certified Nursery Technician Landscape Training Manual* with less than 90% accuracy	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Jim Scott, Dublin, Ohio.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.13 Plan an Integrated Pest Management Program***

Terminal Performance Objective (Outcome):

Given insects, diseases, weeds, and their damage, the student will be able to identify, from memory, the names of the insects, diseases, and weeds, and will recognize their damage to a 90% level of accuracy. The insects, diseases, weeds, and damage will come from the Ohio FFA Nursery/Landscape Career Development Event list.
Given specific insects, diseases, weeds, and their damage, the student will be able to select appropriate control methods to a 95% level of accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.13.1	Follow general safety precautions related to the use of pest controls
10.13.2	Identify insects, diseases, and weeds
10.13.4	Identify various types of insect and disease damage
10.13.9	Evaluate chemical/cultural/biological control options
10.13.10	Select appropriate control methods
10.13.13	Identify disease-resistant and insect-resistant species
10.13.14	Interpret chemical labels and compatibility charts

Applied Academics Competencies:

COMMUNICATIONS

RS1	Exhibit knowledge of language structure
RS6	Apply knowledge of language structure to reading
RS7	Explain why there may be more than one interpretation of reading selections
RS15	Apply an expanding vocabulary gained through reading
RMC3	Read to clarify personal thinking and understanding
RMC12	Use reading as a possible problem-solving strategy to clarify personal thinking and understanding
RMC20	Use reference books to find, evaluate, and synthesize information
RA1	Select and read material for personal enjoyment and information
RA3	Employ various reading strategies according to purpose
RA5	Develop and apply understanding of the interrelationship of concepts

MATHEMATICS

M1	Estimate and use measurements
M4	Understand and apply measurement concepts of distance-rate-time problems and acceleration problems
M8	Establish ratios with and without common units
D7	Read, interpret, and use tables, charts, and graphs to identify patterns, note trends, draw conclusions, and make predictions

Equipment, Supplies, and Other Resources to be Provided:

- insect, disease, and weed specimens from the Ohio FFA Nursery/Landscape Career Development Event list
- insect-damage and disease-damage specimens from the Ohio FFA Nursery/Landscape Career Development Event list
- chemical labels and compatibility charts

Preparations Before Assessment Starts:

The students will take a walking tour of the school land laboratory to observe and collect insects, diseases, weeds, insect-damage, and disease-damage specimens.
The students will be provided information on

1. chemical labels and how to interpret the information on them
2. compatibility charts and how to interpret the information on them
3. the chemical/cultural/biological control options that are available
4. identification of disease-resistant and insect-resistant species
5. safety instruction related to the use of pest controls

Task:

You will identify various insects, diseases, weeds, insect-damaged, and disease-damaged specimens. Based upon the specific insect, disease, weed or damage observed, you will read the various chemical labels and identify appropriate chemical controls and the rate of application. Additionally, you will identify alternative control methods that can be used.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Improvement	Weight
Follow general safety precautions	Can identify and follow safety precautions and can identify potential safety hazards	Can identify and follow safety precautions	Can identify safety precautions	
Identify insects, diseases, and weeds	Can identify insects, diseases, and weeds with 95% accuracy	Can identify insects, diseases, and weeds with 85-94% accuracy	Can identify insects, diseases, and weeds with less than 85% accuracy	

Identify various insect-damaged and disease-damaged specimens	Can identify insect-damaged and disease-damaged specimens with 95% accuracy	Can identify insect-damaged and disease-damaged specimens with 85-94% accuracy	Can identify insect-damaged and disease-damaged specimens with less than 85% accuracy	
Evaluate chemical/cultural/ biological control options	Can identify appropriate controls for pests with 90% accuracy	Can identify appropriate controls for pests with 75-89% accuracy	Can identify appropriate controls for pests with less than 75% accuracy	
Select appropriate control methods	Can select appropriate control methods with 95% accuracy	Can select appropriate control methods with 90-94% accuracy	Can select appropriate control methods with less than 90% accuracy	
Identify disease-resistant and insect-resistant species	Can identify most disease-resistant and insect-resistant species	Can identify some disease-resistant and insect-resistant species	Cannot identify most disease-resistant and insect-resistant species	
Interpret chemical labels and compatibility charts	Can interpret chemical labels and compatibility charts with 100% accuracy	Can interpret chemical labels and compatibility charts with 90-99% accuracy	Can interpret chemical labels and compatibility charts with less than 90% accuracy	
Calculate rate of application	Can calculate rate of application with 95% accuracy	Can calculate rate of application with 85-94% accuracy	Can calculate rate of application with less than 85% accuracy	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Jim Scott, Dublin, Ohio.

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.22 Establish Turf by Sodding***

Terminal Performance Objective (Outcome):

When given a specific area, the student will be able to prepare and sod the area with a 95% level of accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.22.1 Control weedy grasses

10.22.2 Grade the soil site

10.22.3 Prepare the soil for planting

10.22.4 Apply lime and fertilizer

10.22.5 Lay the sod

10.22.6 Water the sod

Applied Academics Competencies:

COMMUNICATIONS

RS1	Exhibit knowledge of language structure
RS6	Apply knowledge of language structure to reading
RMC3	Read to clarify personal thinking and understanding
RA5	Develop and apply understanding of the interrelationship of concepts
RM2	Read to facilitate learning across curriculum

MATHEMATICS

M1	Estimate and use measurements
M9	Construct and interpret maps, tables, charts, and graphs as they relate to real-world mathematics
M17	Express and apply different types of measurement scales
M18	Determine area and volume

Equipment, Supplies, and Other Resources to be Provided:

Bobcat
sod
fertilizer
rakes
herbicide
sprayer
lime
water hose and sprinkler
organic soil amendments

Preparations Before Assessment Starts:

Students will be provided instruction in
1. preparing the site
2. soils
3. rough and final grading techniques
4. techniques of laying sod
5. equipment operation

Task:

You will be given a specific site that needs to be sodded. Prior to sodding, you will need to calculate the amount of sod needed for the site; rough grade the site; add soil amendments, lime and/or fertilizer; and final grade the site.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Improvement	Weight
Control weedy grasses	Able to identify weedy grasses and select and apply an appropriate herbicide	Able to identify weedy grasses and select an appropriate herbicide	Unable to identify weedy grasses or to select an appropriate herbicide	
Grade the soil site	Can grade the site establishing a 2-3% slope away from the buildings	Can grade the site establishing a 4-5% slope away from the buildings	Has difficulty grading the site with less than a 5% slope away from the buildings, or has slope directed toward the buildings	

Prepare the soil for planting	Can identify the existing soil type and add corect amounts of appropriate soil amendments to create an ideal seedbed	Can add appropriate soil amendments to create an ideal seedbed	Cannot add the appropriate soil amendments to create an ideal seedbed	
Apply lime and fertilizer	Can interpret soil test results and apply appropriate amounts of lime/fertilizer uniformly	Can apply appropriate amounts of lime/fertilizer uniformly	Cannot apply appropriate amounts of lime/fertilizer uniformly	
Apply a starter fertilizer	Can calibrate and apply a starter fertilizer to manufacturer's specifications and rake it into the soil	Can apply a starter fertilizer to manufacturer's specifications and rake it into the soil	Has difficulty applying a starter fertilizer to manufacturer's specifications	
Calculate the amount of sod	Can calculate amount of sod needed for the job with 98% or greater accuracy	Can calculate amount of sod needed for the job with 95-97% accuracy	Can calculate amount of sod needed for the job with less than 95% accuracy	
Lay the sod	Lays sod with edges snugly together and ends staggered and then rolled	Lays sod with most edges fitting snugly and most ends staggered	Does not lay sod with edges snugly together and/or has ends not staggered or rolled	
Water the sod	Waters sod thoroughly immediately after laying the sod	Waters sod adequately fairly soon after laying the sod	Water sod inadequately or not immediately after laying it	
Finish Time:		**Score:**		

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Program: Horticulture

Unit: 10. Turf and Landscape Operations

Competency: ***10.23 Determine and Calculate the Fertilizer Needs for the Lawn***

Terminal Performance Objective (Outcome):

Given symptoms of nutrient deficiency, the student will be able to identify the nutrient deficiencies, select the appropriate fertilizer, and calculate the fertilizer rate for a lawn to a 98% level of accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

10.23.1 Follow general safety precautions related to use of fertilizers

10.23.2 Identify symptoms of nutrient deficiency

10.23.3 Determine nutrient requirements

10.23.4 Differentiate between organic and inorganic fertilizers

10.23.5 Determine the kind of fertilizer to apply

10.23.6 Interpret fertilizer labels

10.23.7 Interpret manufacturer's fertilization-ratio charts

10.23.8 Calculate square footage of area to be treated

10.23.9 Determine amount of fertilizer to apply

Applied Academics Competencies:

COMMUNICATIONS

RS1 Exhibit knowledge of language structure

RS6 Apply knowledge of language structure to reading

RS7 Explain why there may be more than one interpretation of reading selections

RMC3 Read to clarify personal thinking and understanding

RMC20 Use reference books to find, evaluate, and synthesize information

RA5 Develop and apply understanding of the interrelationship of concepts

MATHEMATICS

NR2 Estimate answers, compute, and solve problems involving real numbers

M1 Estimate and use measurements

M8 Establish ratios with and without common units

M9 Construct and interpret maps, tables, charts, and graphs as they relate to real-world mathematics

M18 Determine area and volume

E4 Use mental computation when computer and calculator are inappropriate

A29 Decide whether problem situation is best solved using computer, calculator, paper and pencil, or mental arithmetic/estimation techniques

G3 Apply Pythagorean theorem

Equipment, Supplies, and Other Resources to be Provided:
fertilizer bags/labels
calculator
reference books

Preparations Before Assessment Starts:
Students will be provided instruction in
1. understanding soil testing procedures and the analysis of results
2. how to calculate fertilization percentages
3. major nutrients and the symptoms of their deficiencies
4. interpreting fertilizer labels

Task:
You will identify the symptoms of nutrient deficiency present in a specified lawn area and determine the square footage of the area. Additionally, you will determine the nutrient requirements and interpret labels and manufacturer's fertilization-rate charts for the assigned lawn area.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Improvement	Weight
Identify symptoms of nutrient deficiency	Can identify symptoms of nutrient deficiency with 95% accuracy	Can identify symptoms of nutrient deficiency with 85-94% accuracy	Can identify symptoms of nutrient deficiency with less than 85% accuracy	
Determine nutrient requirements	Can interpret soil test results and determine nutrient requirements as identified on the soil test	Can interpret most of the soil test results and determine nutrient requirements as identified on the soil test	Struggles to interpret soil test results and cannot determine nutrient requirements as identified on the soil test	
Differentiate between organic and inorganic fertilizers	Can identify many organic and inorganic fertilizers	Can identify some organic and inorganic fertilizers	Cannot identify most organic and inorganic fertilizers	

Determine the kind of fertilizer to apply	Can select an appropriate fertilizer and alternative fertilizers to apply to a specific area	Can select an appropriate fertilizer to apply to a specific area	Cannot select an appropriate fertilizer to apply to a specific area	
Interpret fertilizer labels	Can interpret nutrient information on fertilizer labels and the amount of nitrogen, phosphoric acid, potash, inert material, and trace elements present	Can interpret nutrient information on fertilizer labels and the amount of nitrogen, phosphoric acid, and potash present	Cannot identify nutrient information on fertilizer labels or the amount of nitrogen, phosphoric acid, potash, inert material, and trace elements present	
Interpret manufacturer's fertilization-ratio charts	Can interpret manufacturer's fertilization-ratio charts with 100% accuracy	Can interpret manufacturer's fertilization-ratio charts with 80-99% accuracy	Can interpret manufacturer's fertilization-ratio charts with less than 80% accuracy	
Calculate square footage of an area	Can calculate square footage within 2% of the correct answer	Can calculate square footage within 3-5% of the correct answer	Cannot calculate square footage within 5% of the correct answer	
Determine the amount of fertilizer to apply	Can calculate the pounds of nitrogen, phosphoric acid, and potash for a specified lawn area	Can calculate the pounds of nitrogen, phosphoric acid, and potash in a specific bag of fertilizer	Cannot calculate the pounds of nitrogen, phosphoric acid, and potash in a specific bag of fertilizer	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Jim Scott, Dublin, Ohio.

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Program: Horticulture

Unit: 11. Nursery and Garden Operations

Competency: ***11.3 Prepare for Propagation***

Terminal Performance Objective (Outcome):

Given different varieties of bulbs, the student will force them in the greenhouse with 90% accuracy.

Competency Builders/Pupil Performance Objectives (Criteria):

11.3.7 Identify methods to break dormancy

11.3.10 Select seed and bulbs

11.3.11 Interpret seed and bulb tag information

11.3.13 Select the container to be used

11.3.18 Determine planting depth

11.3.19 Determine planting schedule

11.3.21 Pre-cool flower bulbs

11.3.23 Treat bulbs to control fungus

Applied Academics Competencies:

COMMUNICATIONS

RS1 Exhibit knowledge of language structure

RS6 Apply knowledge of language structure to reading

RM2 Describe effectiveness of a reading selection

RM3 Read to clarify personal thinking and knowledge

RM4 Support interpretations of text by locating and citing specific information

RM8 Confirm and extend meaning in reading by researching new concepts and facts

RM20 Use reference books to find, evaluate, and synthesize information

RA1 Select and read material for personal enjoyment and information

RA3 Employ various reading strategies according to purpose

RM2 Read to facilitate learning across curriculum

MATHEMATICS

M1 Estimate and use measurements

M2 Understand the need for measurement and the probability that any measurement is accurate to some designated specification

M4 Understand and apply measurement concepts of distance-rate-time problems and acceleration, problems with real-world experiments

M13 Compute total sales from a variety of items

M17 Express and apply different types of measurement scales

D1 Organize data into tables, charts, and graphs

D13 Understand concept of random variable to generate and interpret probability distributions, including binomial, uniform, normal, and chi square

Equipment, Supplies, and Other Resources to be Provided:

bulb tag, thermometer, cooler, containers, bulbs, calendar, fungicide, soil, reference books

Preparations Before Assessment Starts:

Task:
You are a greenhouse grower and have been employed by a large corporation to force spring bulbs for their interior gardens. The company would like the bulbs to arrive in full bloom between February 1 and May 15. It is up to you to plan for the job and plant the bulbs.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	**Excellent**	**Skilled**	**Still Catching On**	**Weight**
Identify methods for breaking dormancy	Chooses the correct method, time, and temperature for bulbs to bloom	Chooses the correct method, but duration of time or temperature is not correct	Understands only that the bulbs will not bloom unless they break dormancy	
Select seeds and bulbs	Selects the appropriate bulbs to force	Knows that some varieties of bulbs force better than others, but still uses reference books	Tries to force all bulb varieties. Does not understand that some force better than others	
Interpret seed and bulb tag information	Can understand and explain information presented on tag	Can read information on tag, but cannot explain it	Reads only the name on tag, not the information	
Select the containers to be used	Selects the proper container in terms of depth and drainage for different bulb types	Selects a container for bulbs that lacks either proper depth or drainage	Does not take into consideration either planting depth or drainage when choosing a container	
Determine planting depth	Determines appropriate depth of planting for different varieties of bulbs	Determines appropriate depth of planting for a few varieties of bulbs	Struggles with the correct planting depth for all varieties of bulbs	
Determine plant scheduling	Determines proper planting date according to the target date	Understands to count back from target date to find planting date, but still needs help	Struggles with determining planting date	
Pre-cool flower bulbs	Understands need to pre-cool flower bulbs to break dormancy. Can locate duration of pre-cooling and correct temperature in reference book	Understands need to pre-cool flower bulbs, but has trouble locating appropriate reference materials	Struggles with the concept that bulbs are cooled for different lengths of time and at different temperatures	

Treat bulbs to control fungus	Understands different methods of controlling fungus on bulbs. Confidentially communicates best methods to use	Understands different methods of controlling fungus on bulbs, but needs help selecting the best method	Understands need for controlling fungus on bulbs, but struggles with knowledge of different methods	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Debra J. Woodworth, Mentor High School, Mentor.

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Program: Horticulture

Unit: 11. Nursery and Garden Operations

Competency: ***11.4 Propagate Plants***

Terminal Performance Objective (Outcome):

Given necessary materials and references, plan, prepare for, and propagate plants by seed, budding, and grafting.

Competency Builders/Pupil Performance Objectives (Criteria):

11.3.6 Identify the factors involved in seed germination

- Using a reference manual, schedule collection, cleaning, and treatment of woody ornamental seed

11.3.7 Identify the two methods for breaking dormancy

- Identify the factors involved in budding and grafting

11.3.19 Using a reference manual, determine plant (propagation) scheduling

11.4.3 Sow seeds in a given location as directed

- Provided scion wood and understock, chip bud & side veneer graft plants

Applied Academics Competencies:

COMMUNICATIONS

RM3 Read to clarify personal thinking and knowledge

RM12 Use reading as a possible problem-solving strategy to clarify personal thinking and knowledge

RM20 Use reference books to find, evaluate, and synthesize information

MATHEMATICS

M1 Estimate and use measurements

D1 Organize data into tables, charts, and graphs

C12 Present persuasive argument based on the scientific aspects of controversial issues

Equipment, Supplies, and Other Resources to be Provided:

1. *Cornus kousa* scion wood and understock
2. *Seeds of Woody Plants in the United States*, U.S.D.A. Handbook No. 450
3. Seed storage supplies
4. Seed germination and growing supplies for understock
5. Budding and grafting knives & ties

Preparations Before Assessment Starts:

Task:
You have been assigned the task of propagating 30 *Cornus kousa* 'Satomi' plants in the next two years. Create a propagation schedule for collection, storage, and sowing of seeds for the understock *Cornus kousa*. Collect, clean, store, germinate, and grow understock. Collect bud wood and chip bud *Cornus kousa* 'Satomi'. Collect scionwood and side veneer graft *Cornus kousa* 'Satomi'.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Competent	Advancing	Introductory	Weight
Identify the factors involved in seed germination Identify the methods for breaking dormancy	Identifies factors of physical and physiological dormancy, scarification and stratification, and environmental requirements for seed germination. Applies knowledge gained	Identifies factors of physical and physiological dormancy, scarification and stratification, and environmental requirements for seed germination	Identifies at least 50% of the factors involved in seed germination	
Schedule collection, cleaning, and treatment of woody ornamental seed	Creates an accurate schedule of collection, cleaning, and treatment of woody ornamental seed	Creates a schedule of collection, cleaning, and treatment of woody ornamental seed with 90% accuracy	Creates a schedule for collection, cleaning, and treatment of woody ornamental seed, but misses one step	
Identify the factors involved in budding and grafting	Identifies the factors of rootstock, scion, compatibility, cambium, callus tissue, and timing/ scheduling, citing their impact on graft success	Identifies 5 of the factors and their impact on graft success	Identifies 3 of the factors and their impact on graft success	

Criteria (Competency Builders)	Competent	Advancing	Introductory	Weight
Sow seeds	Achieves seed germination of 60% or greater from collected, cleaned and treated seed	Achieves seed germination of 50% or greater from collected, cleaned and treated seed	Achieves seed germination of 40% or greater from collected, cleaned and treated seed	
Chip bud & side veneer graft plants	Completes 5 chip buds and 3 side veneer grafts with carpentry and tying to assure survivability of the plant within 20 minutes (10 minutes each)	Completes 3 chip buds and 2 side veneer grafts with carpentry and tying to assure survivability of the plant within 20 minutes (10 minutes each)	Completes 2 chip buds and 1 side veneer graft with carpentry and tying to assure survivability of the plant within 20 minutes (10 minutes each)	
Finish Time:		**Score:**		

Portions of this assessment were submitted by David P. Richards, Auburn Career Center, Concord Twp.

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Program: Horticulture

Unit: 11. Nursery and Garden Operations

Competency: ***11.5 Care for Plants***

Terminal Performance Objective (Outcome):
The student will demonstrate the proper procedures for disbudding and pinching plants.

Competency Builders/Pupil Performance Objectives (Criteria):

11.5.4 Disbud plants

11.5.9 Pinch plants

Applied Academics Competencies:
COMMUNICATIONS

MATHEMATICS
Counting

Equipment, Supplies, and Other Resources to be Provided:
potted mums showing buds
potted cuttings of poinsettias
floral shears

Preparations Before Assessment Starts:
Students will be given proper training in disbudding mums and pinching poinsettias.

Task:
You have been assigned by your employer to disbud 30 potted mums, leaving one terminal per stem. You have also been assigned to pinch back 50 red poinsettias to five leaves per plant.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Disbud plants (mums)	Disbudded all mums properly, leaving one terminal bud per stem	Disbudded 25 of the mums properly	Disbudded half of the mums properly	
Pinch plants (poinsettias)	Properly pinched all poinsettias back to five leaves	Properly pinched 40 poinsettias back to five leaves	Properly pinched half of the poinsettias back to five leaves	

Finish Time:		**Score:**	

Portions of this assessment were submitted by Jerry Schwochow, Vanguard Career Center, Fremont.

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Program: Horticulture

Unit: 11. Nursery and Garden Operations

Competency: ***11.5 Care for Plants***

Terminal Performance Objective (Outcome):

The student will demonstrate the proper procedure for transplanting seedlings, plugs, cuttings, and plants.

Competency Builders/Pupil Performance Objectives (Criteria):

11.5.1 Follow general safety precautions related to plant care

11.5.2 Identify requirements for healthy plant growth

11.5.3 Label plants or cuttings

11.5.5 Transplant seedlings and plugs

11.5.6 Transplant cuttings

11.5.7 Transplant plants

11.5.8 Space plants

Applied Academics Competencies:

COMMUNICATIONS

Writing, spelling

MATHEMATICS

M1 Estimate and use measurements

Equipment, Supplies, and Other Resources to be Provided:

permanent marker
labels
seedlings
plugs
flats
cell packs
hanging basket
soil

Preparations Before Assessment Starts:

- Students will be trained in selecting appropriate containers.
- Students will be trained to transplant and properly handle seedlings, plugs, and cuttings.

Task:
The student will be provided with one flat of petunia seedlings, one flat of petunia plugs, and one flat of ivy geraniums. The student will select the appropriate containers to use. The student will then perform the task of transplanting, labeling, and properly placing the plants on a greenhouse bench according to approved procedures.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Follow general safety precautions related to plant care	Followed general safety precautions during the procedure	Followed most safety precautions during the procedure	Did not follow safety precautions	
Identify requirements for healthy plant growth	Selected proper potting media & containers and placed media in containers properly	Selected proper potting media & containers	Did not make proper selections of potting media or containers	
Label plants or cuttings	Correctly labeled all plants & cuttings using name and date	Labeled all plants correctly, but some labels were hard to read	Labeled some plants correctly; labels were hard to read	
Transplant seedlings & plugs	Properly removed and placed all seedlings & plugs in proper containers	Mishandled some seedlings, but placed them in the proper containers	Did not remove and place all seedlings in the proper containers	
Transplant cuttings	Removed and placed all cuttings in the proper-sized basket	Removed and placed most cuttings properly	Did not handle cuttings correctly; did not use proper containers	
Transplant plants	Removed and placed all plants in the proper-sized basket	Removed and placed most plants properly	Did not handle plants correctly; did not use proper container	

Space plants	Placed all transplanted plants on greenhouse bench at correct spacing	Placed most transplanted plants on greenhouse bench at correct spacing	Did not space plants on bench correctly	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Jerry Schwochow, Vanguard Career Center, Fremont.

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Program: Horticulture

Unit: 11. Nursery and Garden Operations

Competency: ***11.5 Care for Plants***

Terminal Performance Objective (Outcome):

The student will correctly demonstrate how to select and mix the proper growth regulator for 50 poinsettias, and will determine the correct time to apply it.

Competency Builders/Pupil Performance Objectives (Criteria):

11.5.10 Apply growth-regulating compounds

11.5.11 Monitor plant growth

Applied Academics Competencies:

COMMUNICATIONS

Read labels

MATHEMATICS

Use liquid measurement

Equipment, Supplies, and Other Resources to be Provided:

growth regulator
sprayer
liquid measuring container showing ounces
50 poinsettias

Preparations Before Assessment Starts:

- Students will be properly trained in measuring growth regulators.
- Students will be taught the timing for applying growth regulators to a specific crop.

Task:
You have been assigned by your employer to monitor the growth of 50 poinsettias and to apply a growth regulator in the correct amount at the proper time.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Apply growth-regulating compound	Correctly mixed and applied growth regulator at the proper time to all plants	Correctly mixed and applied growth regulator to all plants	Did not mix growth regulator properly, or applied at an incorrect time	
Monitor plant growth	Properly monitored plant growth for applying growth regulator at proper time	Properly monitored plant growth, but missed proper application time	Did not monitor plant growth properly	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Jerry Schwochow, Vanguard Career Center, Fremont.

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Web Page http://www-cms.ag.ohio-state.edu

Program: Horticulture

Unit: 11. Nursery and Garden Operations

Competency: ***11.5 Care for Plants***

Terminal Performance Objective (Outcome):

The student will correctly perform the procedures of tying a plant to a support and thinning out weak shoots.

Competency Builders/Pupil Performance Objectives (Criteria):

11.5.12 Tie plants to supports

11.5.13 Thin out weak shoots

Applied Academics Competencies:

COMMUNICATIONS

MATHEMATICS

Equipment, Supplies, and Other Resources to be Provided:

pruning shears
small trellis
clematis plants
string

Preparations Before Assessment Starts:

- Students will be trained in the proper procedure for thinning out weak shoots.
- Students will be trained in the proper procedure for tying plants to a trellis.

Task:
You have been assigned to tie 20 two-year-old clematis vines to supports. You are also assigned to properly thin out weak or unwanted shoots.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Excellent	Skilled	Needs Help	Weight
Tie plants to support	Correctly tied all plants to the supports	Correctly tied 15 of the plants to the supports	Correctly tied half of the plants to the supports	
Thin out weak shoots	Thinned weak shoots out of all 20 plants properly	Thinned out most weak shoots on all 20 plants properly	Did not thin out the weak shoots on the plants	

Finish Time:		**Score:**	

Portions of this assessment were submitted by Jerry Schwochow, Vanguard Career Center, Fremont.

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Program: Horticulture

Unit: Soils

Competency: ***Select Urban Uses of Soils***

Terminal Performance Objective (Outcome):

When given a soil pit, site area, Ohio Urban Land Judging Scorecard, and slope board, the student will be able to determine the ten soil properties, determine the overall ratings for the four land uses, and recommend the appropriate management practices.

Competency Builders/Pupil Performance Objectives (Criteria):

1. Determine slope
2. Determine landform
3. Determine flood hazard
4. Determine soil stability
5. Determine surface soil texture
6. Determine soil texture between 15" and 30"
7. Determine soil texture between 30" and 60"
8. Determine depth to water table
9. Determine depth to bedrock
10. Determine hard dense soil layer within 40" of surface
11. Determine overall rating for each land use
12. Determine recommended management practices for each urban use

Applied Academics Competencies:

COMMUNICATIONS

MATHEMATICS

M1 Estimate and use measurements

Equipment, Supplies, and Other Resources to be Provided:

soil pit
site flags
Ohio Urban Land Judging Scorecard
county soil survey book

Preparations Before Assessment Starts:

Student will be given instruction in:

1. measuring slope
2. determining landforms
3. determining flood hazards
4. determining soil stability
5. determining texture
6. measuring depth to water table
7. measuring depth to bedrock
8. determining hard dense soil layers
9. recommending management practices
10. using the Ohio Urban Land Judging Scorecard

Task:

Given a soil pit, staked area, slope stakes, Ohio Urban Land Judging Scorecard, and slope boards, the student will be able to determine soil properties and overall ratings for each use, and will be able to recommend management practices for each use.

Student:	
Teacher or Designee:	
Date:	
School/Employer:	
Start Time:	

Criteria (Competency Builders)	Most Acceptable	Acceptable	Unacceptable	Weight
Determine slope	Selects correct slope range	Selects slope grouping that gives correct degree of limitation	Selects slope that gives incorrect degree of limitation	
Determine landform	Selects correct landform		Selects incorrect landform	
Determine flood hazard	Selects correct flood hazard		Selects incorrect flood hazard	
Determine soil stability	Selects correct stability		Selects incorrect stability	

Criteria (Competency Builders)	**Most Acceptable**	**Acceptable**	**Unacceptable**	Weight
Determine surface soil texture	Selects correct soil texture	Selects soil texture that gives correct degree of limitation	Selects soil texture that is incorrect and gives incorrect degree of limitation	
Determine soil texture between 15" and 30"	Selects correct soil texture	Selects soil texture that gives correct degree of limitation	Selects soil texture that is incorrect and gives incorrect degree of limitation	
Determine soil texture between 30" and 60"	Selects correct soil texture	Selects soil texture that gives correct degree of limitation	Selects soil texture that is incorrect and gives incorrect degree of limitation	
Determine depth to water table	Selects correct depth to water table	Selects depth to water table that gives correct degree of limitation	Selects depth to water table that is incorrect and gives incorrect degree of limitation	
Determine depth to bedrock	Selects correct depth to bedrock	Selects depth to bedrock that gives correct degree of limitation	Selects depth to bedrock that is incorrect and gives incorrect degree of limitation	
Determine hard dense soil layer within 40" of surface	Makes correct determination of hard dense soil layer		Makes incorrect determination of hard dense soil layer	
Determine overall ratings for each urban use	Selects correct overall ratings	Selects 3 out of 4 correct overall ratings	Selects less than 3 correct overall ratings	
Determine recommended management practices for each urban use	Selects all management practices correctly	Selects 70% of all management practices correctly	Selects less than 70% of management practices correctly	
Finish Time:		**Score:**		

Portions of this assessment were submitted by Tom Holton, East Knox High School.

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